MySQL服务管理

MyS QL服务器（mysqld）是在MySQL安装中完成大部分工作的主要程序。本章提供了MySQL服务器的概述，并涉及一般的服务器管理。

- 服务器配置

- 数据目录，特别是mysql系统模式

- 服务器日志文件

- 一台机器上多个服务器的管理

关于管理主题的其他信息，还请参见。

- 第6章，安全

- 第7章，备份和恢复

- 第17章，复制

## 5.1 MySQL服务器

mysqld是MySQL服务器。下面的讨论涵盖了这些MySQL服务器配置主题。

- 服务器支持的启动选项。你可以在命令行上指定这些选项，也可以通过配置文件指定，或者两者都指定。

- 服务器系统变量。这些变量反映了启动选项的当前状态和值，其中一些可以在服务器运行时修改。

- 服务器状态变量。这些变量包含关于运行时操作的计数器和统计数据。

- 如何设置服务器的SQL模式。这个设置修改了SQL语法和语义的某些方面，例如，为了与其他数据库系统的代码兼容，或者控制特定情况下的错误处理。

- 服务器如何管理客户端连接。

- 配置和使用 IPv6 和网络命名空间支持。

- 配置和使用时区支持。

- 使用资源组。

- 服务器端的帮助功能。

- 为启用客户端会话状态变化而提供的能力。

- 服务器关机过程。根据表的类型（事务性或非事务性）和是否使用复制，有性能和可靠性方面的考虑。

关于在MySQL 8.0中增加、废弃或删除的MySQL服务器变量和选项的列表，见第1.4节 "在MySQL 8.0中增加、废弃或删除的服务器和状态变量和选项"。

注意

并非所有的存储引擎都受到所有MySQL服务器二进制文件和配置的支持。要了解如何确定你的MySQL服务器安装支持哪些存储引擎，请参见第13.7.7.16节，"SHOW ENGINES语句"。

### 5.1.1 配置服务器

MySQL服务器mysqld有许多命令选项和系统变量，可以在启动时设置以配置其操作。要确定服务器使用的默认命令选项和系统变量值，执行这个命令。

shell> **mysqld --verbose --help**

该命令产生一个所有mysqld选项和可配置系统变量的列表。它的输出包括默认选项和变量值，看起来像这样。

abort-slave-event-count 0

allow-suspicious-udfs FALSE

archive ON

auto-increment-increment 1

auto-increment-offset 1

autocommit TRUE

automatic-sp-privileges TRUE

avoid-temporal-upgrade FALSE

back-log 80

basedir /home/jon/bin/mysql-8.0/

...

tmpdir /tmp

transaction-alloc-block-size 8192

transaction-isolation REPEATABLE-READ

transaction-prealloc-size 4096

transaction-read-only FALSE

transaction-write-set-extraction XXHASH64

updatable-views-with-limit YES

validate-user-plugins TRUE

verbose TRUE

wait-timeout 28800

要查看服务器运行时实际使用的当前系统变量值，请连接到它并执行此语句。

mysql> SHOW VARIABLES。

要查看正在运行的服务器的一些统计和状态指标，执行这个语句。

mysql> SHOW STATUS。

系统变量和状态信息也可以通过mysqladmin命令获得。

shell> mysqladmin variables

shell> mysqladmin extended-status

关于所有命令选项、系统变量和状态变量的完整描述，见这些章节。

- 第5.1.7节，"服务器命令选项"

- 第5.1.8节，"服务器系统变量"

- 第5.1.10节，"服务器状态变量"

更详细的监控信息可从性能模式中获得；见第27章，MySQL性能模式。此外，MySQL sys模式是一组对象，它提供了对性能模式所收集数据的方便访问；参见第28章，MySQL sys模式。

如果你在命令行中为mysqld或mysqld\_safe指定一个选项，它只对服务器的那次调用有效。要在服务器每次运行时使用该选项，请把它放在一个选项文件中。参见第4.2.2.2节，"使用选项文件"。

### 5.1.2默认服务端配置

MySQL服务器有许多操作参数，你可以在服务器启动时使用命令行选项或配置文件（选项文件）改变这些参数。也可以在运行时改变许多参数。关于在启动或运行时设置参数的一般说明，见第5.1.7节 "服务器命令选项"，和第5.1.8节 "服务器系统变量"。

在Windows上，MySQL安装程序与用户交互，并在基本安装目录下创建一个名为my.ini的文件作为默认选项文件。

注意

在Windows上，.ini或.cnf选项文件的扩展名可能不会显示。

完成安装过程后，你可以在任何时候编辑默认选项文件，以修改服务器使用的参数。例如，要使用文件中的参数设置，如果该参数设置在行首有#字符的注释，那么就去掉#，必要时修改参数值。要禁用一个设置，可以在该行的开头加上一个#号，或者将其删除。

对于非Windows平台，在服务器安装或数据目录初始化过程中都没有创建默认的选项文件。按照第4.2.2.2节 "使用选项文件 "中的说明创建你的选项文件。如果没有选项文件，服务器将以其默认设置启动--参见第5.1.2节，"服务器配置默认值"，了解如何检查这些设置。

关于选项文件格式和语法的其他信息，请参见第4.2.2.2节 "使用选项文件"。

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### 5.1.3 验证服务端配置

从MySQL 8.0.16开始，MySQL服务器支持一个--validate-config选项，可以在不以正常运行模式运行服务器的情况下检查启动配置的问题。

mysqld --validate-config

如果没有发现错误，服务器以退出代码0终止；如果发现错误，服务器显示一个诊断信息，并以退出代码1终止。 例如。

shell> mysqld --validate-config --no-such-option

2018-11-05T17:50:12.738919Z 0 [ERROR] [MY-000068] [Server] unknown

选项'--no-such-option'。

2018-11-05T17:50:12.738962Z 0 [ERROR] [MY-010119] [服务器] 终止运行

一旦发现任何错误，服务器就会终止。要发生额外的检查，请纠正最初的问题，并再次用--validate-config运行服务器。

对于前面的例子，使用 --validate-config 的结果是显示错误信息，服务器的退出代码是1。 警告和信息信息也可能被显示，这取决于log\_error\_verbosity值，但不会产生立即的验证终止或退出代码1。 例如，这个命令产生多个警告，都被显示。但是没有错误发生，所以退出代码是0。

shell> **mysqld --validate-config --log\_error\_verbosity=2**

**--read-only=s --transaction\_read\_only=s**

2018-11-05T15:43:18.445863Z 0 [Warning] [MY-000076] [Server] option

'read\_only': boolean value 's' was not recognized. Set to OFF.

2018-11-05T15:43:18.445882Z 0 [Warning] [MY-000076] [Server] option

'transaction-read-only': boolean value 's' was not recognized. Set to OFF.

这个命令产生同样的警告，但也有一个错误，所以错误信息与警告一起显示，退出代码为1。

shell> **mysqld --validate-config --log\_error\_verbosity=2**

**--no-such-option --read-only=s --transaction\_read\_only=s**

2018-11-05T15:43:53.152886Z 0 [Warning] [MY-000076] [Server] option

'read\_only': boolean value 's' was not recognized. Set to OFF.

2018-11-05T15:43:53.152913Z 0 [Warning] [MY-000076] [Server] option

'transaction-read-only': boolean value 's' was not recognized. Set to OFF.

2018-11-05T15:43:53.164889Z 0 [ERROR] [MY-000068] [Server] unknown

option '--no-such-option'.

2018-11-05T15:43:53.165053Z 0 [ERROR] [MY-010119] [Server] Aborting

--validate-config选项的范围仅限于服务器可以在不经历正常启动过程的情况下进行的配置检查。因此，配置检查不会初始化存储引擎和其他插件、组件等，也不会验证与这些未初始化的子系统相关的选项。

--validate-config可以在任何时候使用，但在升级后特别有用，可以检查以前在旧服务器上使用的任何选项是否被升级后的服务器认为是废弃的或过时的。例如，tx\_read\_only系统变量在MySQL 5.7中被废弃，在8.0中被删除。假设一个MySQL 5.7服务器在其my.cnf文件中使用该系统变量运行，然后升级到MySQL 8.0。用--validate-config运行升级后的服务器以检查配置，会产生这种结果

shell> **mysqld --validate-config**

2018-11-05T10:40:02.712141Z 0 [ERROR] [MY-000067] [Server] unknown variable

'tx\_read\_only=ON'.

2018-11-05T10:40:02.712178Z 0 [ERROR] [MY-010119] [Server] Aborting

[--validate-config](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_validate-config) can be used with the [--defaults-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_defaults-file) option to validate only the options in a specific file:

shell> **mysqld --defaults-file=./my.cnf-test --validate-config**

2018-11-05T10:40:02.712141Z 0 [ERROR] [MY-000067] [Server] unknown variable

'tx\_read\_only=ON'.

2018-11-05T10:40:02.712178Z 0 [ERROR] [MY-010119] [Server] Aborting

记住，如果指定了-defaults-file，必须是命令行上的第一个选项。(在执行前面的例子时，如果选项顺序颠倒，就会出现--defaults-file本身未知的信息)。

### 5.1.4 可选服务端配置、系统变量和变量参考

下表列出了在mysqld中适用的所有命令行选项、系统变量和状态变量。

该表在一个统一的列表中列出了命令行选项（Cmd-line）、在配置文件中有效的选项（Option file）、服务器系统变量（System Var）和状态变量（Status var），并说明了每个选项或变量的有效位置。如果在命令行或选项文件中设置的服务器选项与相应的系统变量名称不同，变量名称会紧接着在相应的选项下面注明。对于系统和状态变量，变量的范围（Var Scope）是全局、会话或两者。关于设置和使用选项和变量的细节，请参见相应的项目描述。在适当的地方，还提供了有关项目的进一步信息的直接链接。

关于本表的一个特定于NDB Cluster的版本，请参见第23.3.2.5节，"NDB Cluster mysqld选项和变量参考"。

**Table 5.1 Command-Line Option, System Variable, and Status Variable Summary**

| Name | Cmd-Line | Option File | System Var | Status Var | Var Scope | Dynamic |
| --- | --- | --- | --- | --- | --- | --- |
| [**abort-slave-event-count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_abort-slave-event-count) | Yes | Yes |  |  |  |  |
| [**Aborted\_clients**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Aborted_clients) |  |  |  | Yes | Global | No |
| [**Aborted\_connects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Aborted_connects) |  |  |  | Yes | Global | No |
| [**Acl\_cache\_items\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Acl_cache_items_count) |  |  |  | Yes | Global | No |
| [**activate\_all\_roles\_on\_login**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_activate_all_roles_on_login) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_address) | Yes | Yes | Yes |  | Global | No |
| [**admin\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_port) | Yes | Yes | Yes |  | Global | No |
| [**admin-ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl) | Yes | Yes |  |  |  |  |
| [**admin\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_ca) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_capath) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_cert) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_cipher) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_crl) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_crlpath) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_key) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_tls_ciphersuites) | Yes | Yes | Yes |  | Global | Yes |
| [**admin\_tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_tls_version) | Yes | Yes | Yes |  | Global | Yes |
| [**allow-suspicious-udfs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_allow-suspicious-udfs) | Yes | Yes |  |  |  |  |
| [**ansi**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ansi) | Yes | Yes |  |  |  |  |
| [**audit-log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_audit-log) | Yes | Yes |  |  |  |  |
| [**audit\_log\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_buffer_size) | Yes | Yes | Yes |  | Global | No |
| [**audit\_log\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_compression) | Yes | Yes | Yes |  | Global | No |
| [**audit\_log\_connection\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_connection_policy) | Yes | Yes | Yes |  | Global | Yes |
| [**audit\_log\_current\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_current_session) |  |  | Yes |  | Both | No |
| [**Audit\_log\_current\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_current_size) |  |  |  | Yes | Global | No |
| [**audit\_log\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_encryption) | Yes | Yes | Yes |  | Global | No |
| [**Audit\_log\_event\_max\_drop\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_event_max_drop_size) |  |  |  | Yes | Global | No |
| [**Audit\_log\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_events) |  |  |  | Yes | Global | No |
| [**Audit\_log\_events\_filtered**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_events_filtered) |  |  |  | Yes | Global | No |
| [**Audit\_log\_events\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_events_lost) |  |  |  | Yes | Global | No |
| [**Audit\_log\_events\_written**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_events_written) |  |  |  | Yes | Global | No |
| [**audit\_log\_exclude\_accounts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_exclude_accounts) | Yes | Yes | Yes |  | Global | Yes |
| [**audit\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_file) | Yes | Yes | Yes |  | Global | No |
| [**audit\_log\_filter\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_filter_id) |  |  | Yes |  | Both | No |
| [**audit\_log\_flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_flush) |  |  | Yes |  | Global | Yes |
| [**audit\_log\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_format) | Yes | Yes | Yes |  | Global | No |
| [**audit\_log\_include\_accounts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_include_accounts) | Yes | Yes | Yes |  | Global | Yes |
| [**audit\_log\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_max_size) | Yes | Yes | Yes |  | Global | Yes |
| [**audit\_log\_password\_history\_keep\_days**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_password_history_keep_days) | Yes | Yes | Yes |  | Global | Yes |
| [**audit\_log\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_policy) | Yes | Yes | Yes |  | Global | No |
| [**audit\_log\_prune\_seconds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_prune_seconds) | Yes | Yes | Yes |  | Global | Yes |
| [**audit\_log\_read\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_read_buffer_size) | Yes | Yes | Yes |  | Varies | Varies |
| [**audit\_log\_rotate\_on\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_rotate_on_size) | Yes | Yes | Yes |  | Global | Yes |
| [**audit\_log\_statement\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_statement_policy) | Yes | Yes | Yes |  | Global | Yes |
| [**audit\_log\_strategy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_strategy) | Yes | Yes | Yes |  | Global | No |
| [**Audit\_log\_total\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_total_size) |  |  |  | Yes | Global | No |
| [**Audit\_log\_write\_waits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_write_waits) |  |  |  | Yes | Global | No |
| [**authentication\_ldap\_sasl\_auth\_method\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_auth_method_name) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_bind\_base\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_base_dn) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_bind\_root\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_root_dn) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_bind\_root\_pwd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_root_pwd) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_ca_path) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_group\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_group_search_attr) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_group\_search\_filter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_group_search_filter) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_init\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_init_pool_size) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_log\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_log_status) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_max\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_max_pool_size) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_referral**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_referral) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_server\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_server_host) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_server\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_server_port) | Yes | Yes | Yes |  | Global | Yes |
| [**Authentication\_ldap\_sasl\_supported\_methods**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Authentication_ldap_sasl_supported_methods) |  |  |  | Yes | Global | No |
| [**authentication\_ldap\_sasl\_tls**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_tls) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_sasl\_user\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_user_search_attr) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_auth\_method\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_auth_method_name) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_bind\_base\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_base_dn) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_bind\_root\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_root_dn) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_bind\_root\_pwd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_root_pwd) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_ca_path) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_group\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_group_search_attr) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_group\_search\_filter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_group_search_filter) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_init\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_init_pool_size) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_log\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_log_status) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_max\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_max_pool_size) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_referral**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_referral) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_server\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_server_host) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_server\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_server_port) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_tls**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_tls) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_ldap\_simple\_user\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_user_search_attr) | Yes | Yes | Yes |  | Global | Yes |
| [**authentication\_windows\_log\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_authentication_windows_log_level) | Yes | Yes | Yes |  | Global | No |
| [**authentication\_windows\_use\_principal\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_authentication_windows_use_principal_name) | Yes | Yes | Yes |  | Global | No |
| [**auto\_generate\_certs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_auto_generate_certs) | Yes | Yes | Yes |  | Global | No |
| [**auto\_increment\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_auto_increment_increment) | Yes | Yes | Yes |  | Both | Yes |
| [**auto\_increment\_offset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_auto_increment_offset) | Yes | Yes | Yes |  | Both | Yes |
| [**autocommit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_autocommit) | Yes | Yes | Yes |  | Both | Yes |
| [**automatic\_sp\_privileges**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_automatic_sp_privileges) | Yes | Yes | Yes |  | Global | Yes |
| [**avoid\_temporal\_upgrade**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_avoid_temporal_upgrade) | Yes | Yes | Yes |  | Global | Yes |
| [**back\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_back_log) | Yes | Yes | Yes |  | Global | No |
| [**basedir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_basedir) | Yes | Yes | Yes |  | Global | No |
| [**big\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_big_tables) | Yes | Yes | Yes |  | Both | Yes |
| [**bind\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bind_address) | Yes | Yes | Yes |  | Global | No |
| [**Binlog\_cache\_disk\_use**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Binlog_cache_disk_use) |  |  |  | Yes | Global | No |
| [**binlog\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_cache_size) | Yes | Yes | Yes |  | Global | Yes |
| [**Binlog\_cache\_use**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Binlog_cache_use) |  |  |  | Yes | Global | No |
| [**binlog-checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_binlog-checksum) | Yes | Yes |  |  |  |  |
| [**binlog\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_checksum) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_direct\_non\_transactional\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_direct_non_transactional_updates) | Yes | Yes | Yes |  | Both | Yes |
| [**binlog-do-db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_binlog-do-db) | Yes | Yes |  |  |  |  |
| [**binlog\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_encryption) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_error\_action**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_error_action) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_expire\_logs\_seconds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_expire_logs_seconds) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_format) | Yes | Yes | Yes |  | Both | Yes |
| [**binlog\_group\_commit\_sync\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_group_commit_sync_delay) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_group\_commit\_sync\_no\_delay\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_group_commit_sync_no_delay_count) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_gtid\_simple\_recovery**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_gtid_simple_recovery) | Yes | Yes | Yes |  | Global | No |
| [**binlog-ignore-db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_binlog-ignore-db) | Yes | Yes |  |  |  |  |
| [**binlog\_max\_flush\_queue\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_max_flush_queue_time) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_order\_commits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_order_commits) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_rotate\_encryption\_master\_key\_at\_startup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_rotate_encryption_master_key_at_startup) | Yes | Yes | Yes |  | Global | No |
| [**binlog\_row\_event\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_binlog-row-event-max-size) | Yes | Yes | Yes |  | Global | No |
| [**binlog\_row\_image**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_image) | Yes | Yes | Yes |  | Both | Yes |
| [**binlog\_row\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_metadata) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_row\_value\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_value_options) | Yes | Yes | Yes |  | Both | Yes |
| [**binlog\_rows\_query\_log\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_rows_query_log_events) | Yes | Yes | Yes |  | Both | Yes |
| [**Binlog\_stmt\_cache\_disk\_use**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Binlog_stmt_cache_disk_use) |  |  |  | Yes | Global | No |
| [**binlog\_stmt\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_stmt_cache_size) | Yes | Yes | Yes |  | Global | Yes |
| [**Binlog\_stmt\_cache\_use**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Binlog_stmt_cache_use) |  |  |  | Yes | Global | No |
| [**binlog\_transaction\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_compression) | Yes | Yes | Yes |  | Both | Yes |
| [**binlog\_transaction\_compression\_level\_zstd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_compression_level_zstd) | Yes | Yes | Yes |  | Both | Yes |
| [**binlog\_transaction\_dependency\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_dependency_history_size) | Yes | Yes | Yes |  | Global | Yes |
| [**binlog\_transaction\_dependency\_tracking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_dependency_tracking) | Yes | Yes | Yes |  | Global | Yes |
| [**block\_encryption\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_block_encryption_mode) | Yes | Yes | Yes |  | Both | Yes |
| [**bulk\_insert\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bulk_insert_buffer_size) | Yes | Yes | Yes |  | Both | Yes |
| [**Bytes\_received**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Bytes_received) |  |  |  | Yes | Both | No |
| [**Bytes\_sent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Bytes_sent) |  |  |  | Yes | Both | No |
| [**caching\_sha2\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_auto_generate_rsa_keys) | Yes | Yes | Yes |  | Global | No |
| [**caching\_sha2\_password\_digest\_rounds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_digest_rounds) | Yes | Yes | Yes |  | Global | No |
| [**caching\_sha2\_password\_private\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_private_key_path) | Yes | Yes | Yes |  | Global | No |
| [**caching\_sha2\_password\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_public_key_path) | Yes | Yes | Yes |  | Global | No |
| [**Caching\_sha2\_password\_rsa\_public\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Caching_sha2_password_rsa_public_key) |  |  |  | Yes | Global | No |
| [**character\_set\_client**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_client) |  |  | Yes |  | Both | Yes |
| [**character-set-client-handshake**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_character-set-client-handshake) | Yes | Yes |  |  |  |  |
| [**character\_set\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_connection) |  |  | Yes |  | Both | Yes |
| [**character\_set\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_database) (note 1) |  |  | Yes |  | Both | Yes |
| [**character\_set\_filesystem**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_filesystem) | Yes | Yes | Yes |  | Both | Yes |
| [**character\_set\_results**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_results) |  |  | Yes |  | Both | Yes |
| [**character\_set\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_server) | Yes | Yes | Yes |  | Both | Yes |
| [**character\_set\_system**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_system) |  |  | Yes |  | Global | No |
| [**character\_sets\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_sets_dir) | Yes | Yes | Yes |  | Global | No |
| [**check\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_check_proxy_users) | Yes | Yes | Yes |  | Global | Yes |
| [**chroot**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_chroot) | Yes | Yes |  |  |  |  |
| [**clone\_autotune\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_autotune_concurrency) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_buffer_size) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_ddl\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ddl_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_donor\_timeout\_after\_network\_failure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_donor_timeout_after_network_failure) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_enable\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_enable_compression) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_max\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_concurrency) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_max\_data\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_data_bandwidth) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_max\_network\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_network_bandwidth) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_ca) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_cert) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_key) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_valid\_donor\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_valid_donor_list) | Yes | Yes | Yes |  | Global | Yes |
| [**collation\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_connection) |  |  | Yes |  | Both | Yes |
| [**collation\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_database) (note 1) |  |  | Yes |  | Both | Yes |
| [**collation\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_server) | Yes | Yes | Yes |  | Both | Yes |
| [**Com\_admin\_commands**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_event**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_function**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_procedure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_resource\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_alter\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_tablespace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_alter\_user\_default\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_analyze**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_assign\_to\_keycache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_begin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_call\_procedure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_change\_db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_change\_master**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_change\_repl\_filter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_clone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_commit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_event**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_function**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_procedure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_resource\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_create\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_create\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_trigger**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_udf**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_create\_view**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_dealloc\_sql**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_delete**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_delete\_multi**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_do**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_event**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_function**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_procedure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_resource\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_drop\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_drop\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_trigger**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_drop\_view**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_empty\_query**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_execute\_sql**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_explain\_other**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_get\_diagnostics**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_grant**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_grant\_roles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_group\_replication\_start**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_group\_replication\_stop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_ha\_close**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_ha\_open**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_ha\_read**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_help**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_insert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_insert\_select**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_install\_component**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_install\_plugin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_kill**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_load**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_lock\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_optimize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_preload\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_prepare\_sql**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_purge**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_purge\_before\_date**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_release\_savepoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_rename\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_rename\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_repair**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_replace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_replace\_select**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_replica\_start**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_replica\_stop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_reset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_resignal**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_restart**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_revoke**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_revoke\_all**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_revoke\_roles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_rollback**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_rollback\_to\_savepoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_savepoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_select**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_set\_option**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_set\_resource\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_set\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_show\_authors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_binlog\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_binlogs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_charsets**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_collations**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_contributors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_create\_db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_create\_event**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_create\_func**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_create\_proc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_create\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_create\_trigger**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_create\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_databases**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_engine\_logs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_engine\_mutex**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_engine\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_fields**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_function\_code**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_function\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_grants**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_master\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_ndb\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_open\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_plugins**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_privileges**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_procedure\_code**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_procedure\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_processlist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_profile**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_profiles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_relaylog\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_replica\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_replicas**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_slave\_hosts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_slave\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_storage\_engines**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_table\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_triggers**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_variables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_show\_warnings**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_shutdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_signal**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_slave\_start**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_slave\_stop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_stmt\_close**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_stmt\_execute**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_stmt\_fetch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_stmt\_prepare**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_stmt\_reprepare**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_stmt\_reset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_stmt\_send\_long\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_truncate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_uninstall\_component**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Global | No |
| [**Com\_uninstall\_plugin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_unlock\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_update\_multi**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_xa\_commit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_xa\_end**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_xa\_prepare**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_xa\_recover**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_xa\_rollback**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**Com\_xa\_start**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) |  |  |  | Yes | Both | No |
| [**completion\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_completion_type) | Yes | Yes | Yes |  | Both | Yes |
| [**Compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Compression) |  |  |  | Yes | Session | No |
| [**Compression\_algorithm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Compression_algorithm) |  |  |  | Yes | Global | No |
| [**Compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Compression_level) |  |  |  | Yes | Global | No |
| [**concurrent\_insert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_concurrent_insert) | Yes | Yes | Yes |  | Global | Yes |
| [**connect\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_connect_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**Connection\_control\_delay\_generated**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Connection_control_delay_generated) |  |  |  | Yes | Global | No |
| [**connection\_control\_failed\_connections\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_failed_connections_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**connection\_control\_max\_connection\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_max_connection_delay) | Yes | Yes | Yes |  | Global | Yes |
| [**connection\_control\_min\_connection\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_min_connection_delay) | Yes | Yes | Yes |  | Global | Yes |
| [**Connection\_errors\_accept**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_accept) |  |  |  | Yes | Global | No |
| [**Connection\_errors\_internal**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_internal) |  |  |  | Yes | Global | No |
| [**Connection\_errors\_max\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_max_connections) |  |  |  | Yes | Global | No |
| [**Connection\_errors\_peer\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_peer_address) |  |  |  | Yes | Global | No |
| [**Connection\_errors\_select**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_select) |  |  |  | Yes | Global | No |
| [**Connection\_errors\_tcpwrap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_tcpwrap) |  |  |  | Yes | Global | No |
| [**Connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connections) |  |  |  | Yes | Global | No |
| [**console**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_console) | Yes | Yes |  |  |  |  |
| [**core-file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_core-file) | Yes | Yes |  |  |  |  |
| [**core\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_core_file) |  |  | Yes |  | Global | No |
| [**create\_admin\_listener\_thread**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_create_admin_listener_thread) | Yes | Yes | Yes |  | Global | No |
| [**Created\_tmp\_disk\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Created_tmp_disk_tables) |  |  |  | Yes | Both | No |
| [**Created\_tmp\_files**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Created_tmp_files) |  |  |  | Yes | Global | No |
| [**Created\_tmp\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Created_tmp_tables) |  |  |  | Yes | Both | No |
| [**cte\_max\_recursion\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_cte_max_recursion_depth) | Yes | Yes | Yes |  | Both | Yes |
| [**Current\_tls\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_ca) |  |  |  | Yes | Global | No |
| [**Current\_tls\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_capath) |  |  |  | Yes | Global | No |
| [**Current\_tls\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_cert) |  |  |  | Yes | Global | No |
| [**Current\_tls\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_cipher) |  |  |  | Yes | Global | No |
| [**Current\_tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_ciphersuites) |  |  |  | Yes | Global | No |
| [**Current\_tls\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_crl) |  |  |  | Yes | Global | No |
| [**Current\_tls\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_crlpath) |  |  |  | Yes | Global | No |
| [**Current\_tls\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_key) |  |  |  | Yes | Global | No |
| [**Current\_tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_version) |  |  |  | Yes | Global | No |
| [**daemon\_memcached\_enable\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_enable_binlog) | Yes | Yes | Yes |  | Global | No |
| [**daemon\_memcached\_engine\_lib\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_engine_lib_name) | Yes | Yes | Yes |  | Global | No |
| [**daemon\_memcached\_engine\_lib\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_engine_lib_path) | Yes | Yes | Yes |  | Global | No |
| [**daemon\_memcached\_option**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_option) | Yes | Yes | Yes |  | Global | No |
| [**daemon\_memcached\_r\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_r_batch_size) | Yes | Yes | Yes |  | Global | No |
| [**daemon\_memcached\_w\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_w_batch_size) | Yes | Yes | Yes |  | Global | No |
| [**daemonize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_daemonize) | Yes | Yes |  |  |  |  |
| [**datadir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_datadir) | Yes | Yes | Yes |  | Global | No |
| [**ddl-rewriter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ddl-rewriter) | Yes | Yes |  |  |  |  |
| [**debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_debug) | Yes | Yes | Yes |  | Both | Yes |
| [**debug\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug_sync) |  |  | Yes |  | Session | Yes |
| [**debug-sync-timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_debug-sync-timeout) | Yes | Yes |  |  |  |  |
| [**default\_authentication\_plugin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_authentication_plugin) | Yes | Yes | Yes |  | Global | No |
| [**default\_collation\_for\_utf8mb4**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_collation_for_utf8mb4) |  |  | Yes |  | Both | Yes |
| [**default\_password\_lifetime**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_password_lifetime) | Yes | Yes | Yes |  | Global | Yes |
| [**default\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_storage_engine) | Yes | Yes | Yes |  | Both | Yes |
| [**default\_table\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_table_encryption) | Yes | Yes | Yes |  | Both | Yes |
| [**default-time-zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_default-time-zone) | Yes | Yes |  |  |  |  |
| [**default\_tmp\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_tmp_storage_engine) | Yes | Yes | Yes |  | Both | Yes |
| [**default\_week\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_week_format) | Yes | Yes | Yes |  | Both | Yes |
| [**defaults-extra-file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_defaults-extra-file) | Yes |  |  |  |  |  |
| [**defaults-file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_defaults-file) | Yes |  |  |  |  |  |
| [**defaults-group-suffix**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_defaults-group-suffix) | Yes |  |  |  |  |  |
| [**delay\_key\_write**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delay_key_write) | Yes | Yes | Yes |  | Global | Yes |
| [**Delayed\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Delayed_errors) |  |  |  | Yes | Global | No |
| [**delayed\_insert\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_insert_limit) | Yes | Yes | Yes |  | Global | Yes |
| [**Delayed\_insert\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Delayed_insert_threads) |  |  |  | Yes | Global | No |
| [**delayed\_insert\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_insert_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**delayed\_queue\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_queue_size) | Yes | Yes | Yes |  | Global | Yes |
| [**Delayed\_writes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Delayed_writes) |  |  |  | Yes | Global | No |
| [**disabled\_storage\_engines**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_disabled_storage_engines) | Yes | Yes | Yes |  | Global | No |
| [**disconnect\_on\_expired\_password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_disconnect_on_expired_password) | Yes | Yes | Yes |  | Global | No |
| [**disconnect-slave-event-count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_disconnect-slave-event-count) | Yes | Yes |  |  |  |  |
| [**div\_precision\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_div_precision_increment) | Yes | Yes | Yes |  | Both | Yes |
| [**dragnet.log\_error\_filter\_rules**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_dragnet.log_error_filter_rules) | Yes | Yes | Yes |  | Global | Yes |
| [**dragnet.Status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_dragnet.Status) |  |  |  | Yes | Global | No |
| [**early-plugin-load**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_early-plugin-load) | Yes | Yes |  |  |  |  |
| [**end\_markers\_in\_json**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_end_markers_in_json) | Yes | Yes | Yes |  | Both | Yes |
| [**enforce\_gtid\_consistency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_enforce_gtid_consistency) | Yes | Yes | Yes |  | Global | Yes |
| [**eq\_range\_index\_dive\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_eq_range_index_dive_limit) | Yes | Yes | Yes |  | Both | Yes |
| [**error\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_error_count) |  |  | Yes |  | Session | No |
| [**Error\_log\_buffered\_bytes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Error_log_buffered_bytes) |  |  |  | Yes | Global | No |
| [**Error\_log\_buffered\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Error_log_buffered_events) |  |  |  | Yes | Global | No |
| [**Error\_log\_expired\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Error_log_expired_events) |  |  |  | Yes | Global | No |
| [**Error\_log\_latest\_write**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Error_log_latest_write) |  |  |  | Yes | Global | No |
| [**event\_scheduler**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_event_scheduler) | Yes | Yes | Yes |  | Global | Yes |
| [**exit-info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_exit-info) | Yes | Yes |  |  |  |  |
| [**expire\_logs\_days**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_expire_logs_days) | Yes | Yes | Yes |  | Global | Yes |
| [**explicit\_defaults\_for\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_explicit_defaults_for_timestamp) | Yes | Yes | Yes |  | Both | Yes |
| [**external-locking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_external-locking) | Yes | Yes |  |  |  |  |
| - Variable: **[skip\_external\_locking](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_external_locking)** |  |  |  |  |  |  |
| [**external\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_external_user) |  |  | Yes |  | Session | No |
| [**federated**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\storage-engines.html#federated-storage-engine) | Yes | Yes |  |  |  |  |
| [**Firewall\_access\_denied**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Firewall_access_denied) |  |  |  | Yes | Global | No |
| [**Firewall\_access\_granted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Firewall_access_granted) |  |  |  | Yes | Global | No |
| [**Firewall\_cached\_entries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Firewall_cached_entries) |  |  |  | Yes | Global | No |
| [**flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush) | Yes | Yes | Yes |  | Global | Yes |
| [**Flush\_commands**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Flush_commands) |  |  |  | Yes | Global | No |
| [**flush\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush_time) | Yes | Yes | Yes |  | Global | Yes |
| [**foreign\_key\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_foreign_key_checks) |  |  | Yes |  | Both | Yes |
| [**ft\_boolean\_syntax**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_boolean_syntax) | Yes | Yes | Yes |  | Global | Yes |
| [**ft\_max\_word\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_max_word_len) | Yes | Yes | Yes |  | Global | No |
| [**ft\_min\_word\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_min_word_len) | Yes | Yes | Yes |  | Global | No |
| [**ft\_query\_expansion\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_query_expansion_limit) | Yes | Yes | Yes |  | Global | No |
| [**ft\_stopword\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_stopword_file) | Yes | Yes | Yes |  | Global | No |
| [**gdb**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_gdb) | Yes | Yes |  |  |  |  |
| [**general\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log) | Yes | Yes | Yes |  | Global | Yes |
| [**general\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log_file) | Yes | Yes | Yes |  | Global | Yes |
| [**generated\_random\_password\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_generated_random_password_length) | Yes | Yes | Yes |  | Both | Yes |
| [**group\_concat\_max\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_group_concat_max_len) | Yes | Yes | Yes |  | Both | Yes |
| [**group\_replication\_advertise\_recovery\_endpoints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_advertise_recovery_endpoints) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_allow\_local\_lower\_version\_join**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_allow_local_lower_version_join) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_auto\_increment\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_auto_increment_increment) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_autorejoin\_tries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_autorejoin_tries) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_bootstrap\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_bootstrap_group) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_clone\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_clone_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_communication\_debug\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_communication_debug_options) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_communication\_max\_message\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_communication_max_message_size) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_components\_stop\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_components_stop_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_compression\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_compression_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_consistency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_consistency) | Yes | Yes | Yes |  | Both | Yes |
| [**group\_replication\_enforce\_update\_everywhere\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_enforce_update_everywhere_checks) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_exit\_state\_action**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_exit_state_action) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_applier\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_applier_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_certifier\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_certifier_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_hold\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_hold_percent) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_max\_commit\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_max_commit_quota) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_member\_quota\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_member_quota_percent) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_min\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_min_quota) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_min\_recovery\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_min_recovery_quota) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_mode) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_period) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_flow\_control\_release\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_release_percent) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_force\_members**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_force_members) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_group\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_group_name) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_group\_seeds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_group_seeds) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_gtid\_assignment\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_gtid_assignment_block_size) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_ip\_allowlist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ip_allowlist) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_ip\_whitelist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ip_whitelist) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_local\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_local_address) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_member\_expel\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_member_expel_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_member\_weight**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_member_weight) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_message\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_message_cache_size) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_poll\_spin\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_poll_spin_loops) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_primary\_member**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_group_replication_primary_member) |  |  |  | Yes | Global | No |
| [**group\_replication\_recovery\_complete\_at**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_complete_at) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_compression_algorithms) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_get\_public\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_get_public_key) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_public_key_path) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_reconnect\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_reconnect_interval) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_retry\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_retry_count) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_ca) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_capath) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_cert) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_cipher) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_crl) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_crlpath) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_key) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_ssl\_verify\_server\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_verify_server_cert) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_tls_ciphersuites) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_tls_version) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_use\_ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_use_ssl) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_recovery\_zstd\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_zstd_compression_level) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_single\_primary\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_single_primary_mode) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_ssl\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ssl_mode) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_start\_on\_boot**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_start_on_boot) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_tls\_source**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_tls_source) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_transaction\_size\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_transaction_size_limit) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_unreachable\_majority\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_unreachable_majority_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**group\_replication\_view\_change\_uuid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_view_change_uuid) | Yes | Yes | Yes |  | Global | Yes |
| [**gtid\_executed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_executed) |  |  | Yes |  | Global | No |
| [**gtid\_executed\_compression\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_executed_compression_period) | Yes | Yes | Yes |  | Global | Yes |
| [**gtid\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_mode) | Yes | Yes | Yes |  | Global | Yes |
| [**gtid\_next**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_next) |  |  | Yes |  | Session | Yes |
| [**gtid\_owned**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_owned) |  |  | Yes |  | Both | No |
| [**gtid\_purged**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_purged) |  |  | Yes |  | Global | Yes |
| [**Handler\_commit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_commit) |  |  |  | Yes | Both | No |
| [**Handler\_delete**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_delete) |  |  |  | Yes | Both | No |
| [**Handler\_discover**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Handler_discover) |  |  |  | Yes | Both | No |
| [**Handler\_external\_lock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_external_lock) |  |  |  | Yes | Both | No |
| [**Handler\_mrr\_init**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_mrr_init) |  |  |  | Yes | Both | No |
| [**Handler\_prepare**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_prepare) |  |  |  | Yes | Both | No |
| [**Handler\_read\_first**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_first) |  |  |  | Yes | Both | No |
| [**Handler\_read\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_key) |  |  |  | Yes | Both | No |
| [**Handler\_read\_last**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_last) |  |  |  | Yes | Both | No |
| [**Handler\_read\_next**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_next) |  |  |  | Yes | Both | No |
| [**Handler\_read\_prev**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_prev) |  |  |  | Yes | Both | No |
| [**Handler\_read\_rnd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_rnd) |  |  |  | Yes | Both | No |
| [**Handler\_read\_rnd\_next**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_rnd_next) |  |  |  | Yes | Both | No |
| [**Handler\_rollback**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_rollback) |  |  |  | Yes | Both | No |
| [**Handler\_savepoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_savepoint) |  |  |  | Yes | Both | No |
| [**Handler\_savepoint\_rollback**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_savepoint_rollback) |  |  |  | Yes | Both | No |
| [**Handler\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_update) |  |  |  | Yes | Both | No |
| [**Handler\_write**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_write) |  |  |  | Yes | Both | No |
| [**have\_compress**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_compress) |  |  | Yes |  | Global | No |
| [**have\_dynamic\_loading**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_dynamic_loading) |  |  | Yes |  | Global | No |
| [**have\_geometry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_geometry) |  |  | Yes |  | Global | No |
| [**have\_openssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_openssl) |  |  | Yes |  | Global | No |
| [**have\_profiling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_profiling) |  |  | Yes |  | Global | No |
| [**have\_query\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_query_cache) |  |  | Yes |  | Global | No |
| [**have\_rtree\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_rtree_keys) |  |  | Yes |  | Global | No |
| [**have\_ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_ssl) |  |  | Yes |  | Global | No |
| [**have\_statement\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_statement_timeout) |  |  | Yes |  | Global | No |
| [**have\_symlink**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_symlink) |  |  | Yes |  | Global | No |
| [**help**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_help) | Yes | Yes |  |  |  |  |
| [**histogram\_generation\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_histogram_generation_max_mem_size) | Yes | Yes | Yes |  | Both | Yes |
| [**host\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_host_cache_size) | Yes | Yes | Yes |  | Global | Yes |
| [**hostname**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_hostname) |  |  | Yes |  | Global | No |
| [**identity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_identity) |  |  | Yes |  | Session | Yes |
| [**immediate\_server\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_immediate_server_version) |  |  | Yes |  | Session | Yes |
| [**information\_schema\_stats\_expiry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_information_schema_stats_expiry) | Yes | Yes | Yes |  | Both | Yes |
| [**init\_connect**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_init_connect) | Yes | Yes | Yes |  | Global | Yes |
| [**init\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_init_file) | Yes | Yes | Yes |  | Global | No |
| [**init\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_init_slave) | Yes | Yes | Yes |  | Global | Yes |
| [**initialize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_initialize) | Yes | Yes |  |  |  |  |
| [**initialize-insecure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_initialize-insecure) | Yes | Yes |  |  |  |  |
| [**innodb**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#option_mysqld_innodb) | Yes | Yes |  |  |  |  |
| [**innodb\_adaptive\_flushing**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_flushing) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_adaptive\_flushing\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_flushing_lwm) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_adaptive\_hash\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_hash_index) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_adaptive\_hash\_index\_parts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_hash_index_parts) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_adaptive\_max\_sleep\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_max_sleep_delay) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_api\_bk\_commit\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_bk_commit_interval) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_api\_disable\_rowlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_disable_rowlock) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_api\_enable\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_enable_binlog) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_api\_enable\_mdl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_enable_mdl) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_api\_trx\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_trx_level) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_autoextend\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_autoextend_increment) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_autoinc\_lock\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_autoinc_lock_mode) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_background\_drop\_list\_empty**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_background_drop_list_empty) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_buffer\_pool\_bytes\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_bytes_data) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_bytes\_dirty**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_bytes_dirty) |  |  |  | Yes | Global | No |
| [**innodb\_buffer\_pool\_chunk\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_chunk_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_buffer\_pool\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_debug) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_buffer\_pool\_dump\_at\_shutdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_at_shutdown) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_buffer\_pool\_dump\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_now) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_buffer\_pool\_dump\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_pct) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_buffer\_pool\_dump\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_dump_status) |  |  |  | Yes | Global | No |
| [**innodb\_buffer\_pool\_filename**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_filename) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_buffer\_pool\_in\_core\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_in_core_file) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_buffer\_pool\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_instances) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_buffer\_pool\_load\_abort**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_abort) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_buffer\_pool\_load\_at\_startup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_at_startup) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_buffer\_pool\_load\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_now) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_buffer\_pool\_load\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_load_status) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_pages\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_data) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_pages\_dirty**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_dirty) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_pages\_flushed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_flushed) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_pages\_free**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_free) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_pages\_latched**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_latched) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_pages\_misc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_misc) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_pages\_total**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_total) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_read\_ahead**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_read_ahead) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_read\_ahead\_evicted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_read_ahead_evicted) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_read\_ahead\_rnd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_read_ahead_rnd) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_read\_requests**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_read_requests) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_reads) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_resize\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_resize_status) |  |  |  | Yes | Global | No |
| [**innodb\_buffer\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_size) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_buffer\_pool\_wait\_free**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_wait_free) |  |  |  | Yes | Global | No |
| [**Innodb\_buffer\_pool\_write\_requests**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_write_requests) |  |  |  | Yes | Global | No |
| [**innodb\_change\_buffer\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffer_max_size) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_change\_buffering**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffering) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_change\_buffering\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffering_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_checkpoint\_disabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_checkpoint_disabled) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_checksum\_algorithm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_checksum_algorithm) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_cmp\_per\_index\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_cmp_per_index_enabled) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_commit\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_commit_concurrency) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_compress\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compress_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_compression\_failure\_threshold\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_failure_threshold_pct) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_level) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_compression\_pad\_pct\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_pad_pct_max) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_concurrency\_tickets**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_concurrency_tickets) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_data\_file\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_data_file_path) | Yes | Yes | Yes |  | Global | No |
| [**Innodb\_data\_fsyncs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_fsyncs) |  |  |  | Yes | Global | No |
| [**innodb\_data\_home\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_data_home_dir) | Yes | Yes | Yes |  | Global | No |
| [**Innodb\_data\_pending\_fsyncs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_pending_fsyncs) |  |  |  | Yes | Global | No |
| [**Innodb\_data\_pending\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_pending_reads) |  |  |  | Yes | Global | No |
| [**Innodb\_data\_pending\_writes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_pending_writes) |  |  |  | Yes | Global | No |
| [**Innodb\_data\_read**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_read) |  |  |  | Yes | Global | No |
| [**Innodb\_data\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_reads) |  |  |  | Yes | Global | No |
| [**Innodb\_data\_writes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_writes) |  |  |  | Yes | Global | No |
| [**Innodb\_data\_written**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_written) |  |  |  | Yes | Global | No |
| [**Innodb\_dblwr\_pages\_written**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_dblwr_pages_written) |  |  |  | Yes | Global | No |
| [**Innodb\_dblwr\_writes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_dblwr_writes) |  |  |  | Yes | Global | No |
| [**innodb\_ddl\_log\_crash\_reset\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ddl_log_crash_reset_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_deadlock\_detect**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_deadlock_detect) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_dedicated\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_dedicated_server) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_default\_row\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_default_row_format) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_directories**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_directories) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_disable\_sort\_file\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_disable_sort_file_cache) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_doublewrite**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_doublewrite\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite_batch_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_doublewrite\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite_dir) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_doublewrite\_files**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite_files) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_doublewrite\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite_pages) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_extend\_and\_initialize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_extend_and_initialize) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_fast\_shutdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fast_shutdown) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_fil\_make\_page\_dirty\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fil_make_page_dirty_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_file\_per\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_file_per_table) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_fill\_factor**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fill_factor) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_flush\_log\_at\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_log_at_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_flush\_log\_at\_trx\_commit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_log_at_trx_commit) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_flush\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_method) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_flush\_neighbors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_neighbors) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_flush\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_sync) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_flushing\_avg\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flushing_avg_loops) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_force\_load\_corrupted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_force_load_corrupted) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_force\_recovery**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_force_recovery) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_fsync\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fsync_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_ft\_aux\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_aux_table) |  |  | Yes |  | Global | Yes |
| [**innodb\_ft\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_cache_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_ft\_enable\_diag\_print**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_enable_diag_print) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_ft\_enable\_stopword**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_enable_stopword) | Yes | Yes | Yes |  | Both | Yes |
| [**innodb\_ft\_max\_token\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_max_token_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_ft\_min\_token\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_min_token_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_ft\_num\_word\_optimize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_num_word_optimize) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_ft\_result\_cache\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_result_cache_limit) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_ft\_server\_stopword\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_server_stopword_table) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_ft\_sort\_pll\_degree**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_sort_pll_degree) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_ft\_total\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_total_cache_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_ft\_user\_stopword\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_user_stopword_table) | Yes | Yes | Yes |  | Both | Yes |
| [**Innodb\_have\_atomic\_builtins**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_have_atomic_builtins) |  |  |  | Yes | Global | No |
| [**innodb\_idle\_flush\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_idle_flush_pct) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_io\_capacity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_io_capacity) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_io\_capacity\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_io_capacity_max) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_limit\_optimistic\_insert\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_limit_optimistic_insert_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_lock_wait_timeout) | Yes | Yes | Yes |  | Both | Yes |
| [**innodb\_log\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_buffer_size) | Yes | Yes | Yes |  | Global | Varies |
| [**innodb\_log\_checkpoint\_fuzzy\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checkpoint_fuzzy_now) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_log\_checkpoint\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checkpoint_now) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_log\_checksums**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checksums) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_log\_compressed\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_compressed_pages) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_log\_file\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_file_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_log\_files\_in\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_files_in_group) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_log\_group\_home\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_group_home_dir) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_log\_spin\_cpu\_abs\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_spin_cpu_abs_lwm) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_log\_spin\_cpu\_pct\_hwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_spin_cpu_pct_hwm) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_log\_wait\_for\_flush\_spin\_hwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_wait_for_flush_spin_hwm) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_log\_waits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_log_waits) |  |  |  | Yes | Global | No |
| [**innodb\_log\_write\_ahead\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_write_ahead_size) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_log\_write\_requests**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_log_write_requests) |  |  |  | Yes | Global | No |
| [**innodb\_log\_writer\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_writer_threads) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_log\_writes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_log_writes) |  |  |  | Yes | Global | No |
| [**innodb\_lru\_scan\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_lru_scan_depth) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_max\_dirty\_pages\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_dirty_pages_pct) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_max\_dirty\_pages\_pct\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_dirty_pages_pct_lwm) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_max\_purge\_lag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_purge_lag) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_max\_purge\_lag\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_purge_lag_delay) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_max\_undo\_log\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_undo_log_size) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_merge\_threshold\_set\_all\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_merge_threshold_set_all_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_monitor\_disable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_disable) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_monitor\_enable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_enable) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_monitor\_reset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_reset) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_monitor\_reset\_all**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_reset_all) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_num\_open\_files**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_num_open_files) |  |  |  | Yes | Global | No |
| [**innodb\_numa\_interleave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_numa_interleave) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_old\_blocks\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_old_blocks_pct) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_old\_blocks\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_old_blocks_time) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_online\_alter\_log\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_online_alter_log_max_size) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_open\_files**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_open_files) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_optimize\_fulltext\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_optimize_fulltext_only) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_os\_log\_fsyncs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_os_log_fsyncs) |  |  |  | Yes | Global | No |
| [**Innodb\_os\_log\_pending\_fsyncs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_os_log_pending_fsyncs) |  |  |  | Yes | Global | No |
| [**Innodb\_os\_log\_pending\_writes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_os_log_pending_writes) |  |  |  | Yes | Global | No |
| [**Innodb\_os\_log\_written**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_os_log_written) |  |  |  | Yes | Global | No |
| [**innodb\_page\_cleaners**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_page_cleaners) | Yes | Yes | Yes |  | Global | No |
| [**Innodb\_page\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_page_size) |  |  |  | Yes | Global | No |
| [**innodb\_page\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_page_size) | Yes | Yes | Yes |  | Global | No |
| [**Innodb\_pages\_created**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_pages_created) |  |  |  | Yes | Global | No |
| [**Innodb\_pages\_read**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_pages_read) |  |  |  | Yes | Global | No |
| [**Innodb\_pages\_written**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_pages_written) |  |  |  | Yes | Global | No |
| [**innodb\_parallel\_read\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_parallel_read_threads) | Yes | Yes | Yes |  | Session | Yes |
| [**innodb\_print\_all\_deadlocks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_print_all_deadlocks) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_print\_ddl\_logs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_print_ddl_logs) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_purge\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_purge_batch_size) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_purge\_rseg\_truncate\_frequency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_purge_rseg_truncate_frequency) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_purge\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_purge_threads) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_random\_read\_ahead**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_random_read_ahead) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_read\_ahead\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_read_ahead_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_read\_io\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_read_io_threads) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_read_only) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_redo\_log\_archive\_dirs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_redo_log_archive_dirs) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_redo\_log\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_redo_log_enabled) |  |  |  | Yes | Global | No |
| [**innodb\_redo\_log\_encrypt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_redo_log_encrypt) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_replication\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_replication_delay) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_rollback\_on\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_rollback_on_timeout) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_rollback\_segments**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_rollback_segments) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_row\_lock\_current\_waits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_current_waits) |  |  |  | Yes | Global | No |
| [**Innodb\_row\_lock\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_time) |  |  |  | Yes | Global | No |
| [**Innodb\_row\_lock\_time\_avg**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_time_avg) |  |  |  | Yes | Global | No |
| [**Innodb\_row\_lock\_time\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_time_max) |  |  |  | Yes | Global | No |
| [**Innodb\_row\_lock\_waits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_waits) |  |  |  | Yes | Global | No |
| [**Innodb\_rows\_deleted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_rows_deleted) |  |  |  | Yes | Global | No |
| [**Innodb\_rows\_inserted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_rows_inserted) |  |  |  | Yes | Global | No |
| [**Innodb\_rows\_read**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_rows_read) |  |  |  | Yes | Global | No |
| [**Innodb\_rows\_updated**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_rows_updated) |  |  |  | Yes | Global | No |
| [**innodb\_saved\_page\_number\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_saved_page_number_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_segment\_reserve\_factor**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_segment_reserve_factor) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sort_buffer_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_spin\_wait\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_spin_wait_delay) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_spin\_wait\_pause\_multiplier**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_spin_wait_pause_multiplier) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_stats\_auto\_recalc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_auto_recalc) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_stats\_include\_delete\_marked**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_include_delete_marked) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_stats\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_method) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_stats\_on\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_on_metadata) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_stats\_persistent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_persistent) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_stats\_persistent\_sample\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_persistent_sample_pages) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_stats\_transient\_sample\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_transient_sample_pages) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb-status-file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#option_mysqld_innodb-status-file) | Yes | Yes |  |  |  |  |
| [**innodb\_status\_output**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_status_output) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_status\_output\_locks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_status_output_locks) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_strict\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_strict_mode) | Yes | Yes | Yes |  | Both | Yes |
| [**innodb\_sync\_array\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sync_array_size) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_sync\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sync_debug) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_sync\_spin\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sync_spin_loops) | Yes | Yes | Yes |  | Global | Yes |
| [**Innodb\_system\_rows\_deleted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_system_rows_deleted) |  |  |  | Yes | Global | No |
| [**Innodb\_system\_rows\_inserted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_system_rows_inserted) |  |  |  | Yes | Global | No |
| [**Innodb\_system\_rows\_read**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_system_rows_read) |  |  |  | Yes | Global | No |
| [**innodb\_table\_locks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_table_locks) | Yes | Yes | Yes |  | Both | Yes |
| [**innodb\_temp\_data\_file\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_temp_data_file_path) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_temp\_tablespaces\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_temp_tablespaces_dir) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_thread\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_thread_concurrency) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_thread\_sleep\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_thread_sleep_delay) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_tmpdir) | Yes | Yes | Yes |  | Both | Yes |
| [**Innodb\_truncated\_status\_writes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_truncated_status_writes) |  |  |  | Yes | Global | No |
| [**innodb\_trx\_purge\_view\_update\_only\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_trx_purge_view_update_only_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_trx\_rseg\_n\_slots\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_trx_rseg_n_slots_debug) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_undo\_directory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_directory) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_undo\_log\_encrypt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_log_encrypt) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_undo\_log\_truncate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_log_truncate) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_undo\_tablespaces**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_tablespaces) | Yes | Yes | Yes |  | Global | Varies |
| [**Innodb\_undo\_tablespaces\_active**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_undo_tablespaces_active) |  |  |  | Yes | Global | No |
| [**Innodb\_undo\_tablespaces\_explicit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_undo_tablespaces_explicit) |  |  |  | Yes | Global | No |
| [**Innodb\_undo\_tablespaces\_implicit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_undo_tablespaces_implicit) |  |  |  | Yes | Global | No |
| [**Innodb\_undo\_tablespaces\_total**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_undo_tablespaces_total) |  |  |  | Yes | Global | No |
| [**innodb\_use\_fdatasync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_use_fdatasync) | Yes | Yes | Yes |  | Global | Yes |
| [**innodb\_use\_native\_aio**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_use_native_aio) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_validate\_tablespace\_paths**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_validate_tablespace_paths) | Yes | Yes | Yes |  | Global | No |
| [**innodb\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_version) |  |  | Yes |  | Global | No |
| [**innodb\_write\_io\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_write_io_threads) | Yes | Yes | Yes |  | Global | No |
| [**insert\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_insert_id) |  |  | Yes |  | Session | Yes |
| [**install**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_install) | Yes |  |  |  |  |  |
| [**install-manual**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_install-manual) | Yes |  |  |  |  |  |
| [**interactive\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_interactive_timeout) | Yes | Yes | Yes |  | Both | Yes |
| [**internal\_tmp\_disk\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_internal_tmp_disk_storage_engine) | Yes | Yes | Yes |  | Global | Yes |
| [**internal\_tmp\_mem\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_internal_tmp_mem_storage_engine) | Yes | Yes | Yes |  | Both | Yes |
| [**join\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_join_buffer_size) | Yes | Yes | Yes |  | Both | Yes |
| [**keep\_files\_on\_create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_keep_files_on_create) | Yes | Yes | Yes |  | Both | Yes |
| [**Key\_blocks\_not\_flushed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_blocks_not_flushed) |  |  |  | Yes | Global | No |
| [**Key\_blocks\_unused**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_blocks_unused) |  |  |  | Yes | Global | No |
| [**Key\_blocks\_used**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_blocks_used) |  |  |  | Yes | Global | No |
| [**key\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_buffer_size) | Yes | Yes | Yes |  | Global | Yes |
| [**key\_cache\_age\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_age_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**key\_cache\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_block_size) | Yes | Yes | Yes |  | Global | Yes |
| [**key\_cache\_division\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_division_limit) | Yes | Yes | Yes |  | Global | Yes |
| [**Key\_read\_requests**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_read_requests) |  |  |  | Yes | Global | No |
| [**Key\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_reads) |  |  |  | Yes | Global | No |
| [**Key\_write\_requests**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_write_requests) |  |  |  | Yes | Global | No |
| [**Key\_writes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_writes) |  |  |  | Yes | Global | No |
| [**keyring\_aws\_cmk\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_cmk_id) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_aws\_conf\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_conf_file) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_aws\_data\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_data_file) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_aws\_region**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_region) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_encrypted\_file\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_encrypted_file_data) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_encrypted\_file\_password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_encrypted_file_password) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_file\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_file_data) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_hashicorp\_auth\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_auth_path) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_hashicorp\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_ca_path) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_hashicorp\_caching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_caching) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_hashicorp\_commit\_auth\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_auth_path) |  |  | Yes |  | Global | No |
| [**keyring\_hashicorp\_commit\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_ca_path) |  |  | Yes |  | Global | No |
| [**keyring\_hashicorp\_commit\_caching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_caching) |  |  | Yes |  | Global | No |
| [**keyring\_hashicorp\_commit\_role\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_role_id) |  |  | Yes |  | Global | No |
| [**keyring\_hashicorp\_commit\_server\_url**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_server_url) |  |  | Yes |  | Global | No |
| [**keyring\_hashicorp\_commit\_store\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_store_path) |  |  | Yes |  | Global | No |
| [**keyring\_hashicorp\_role\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_role_id) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_hashicorp\_secret\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_secret_id) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_hashicorp\_server\_url**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_server_url) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_hashicorp\_store\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_store_path) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring-migration-destination**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_keyring-migration-destination) | Yes | Yes |  |  |  |  |
| [**keyring-migration-host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_keyring-migration-host) | Yes | Yes |  |  |  |  |
| [**keyring-migration-password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_keyring-migration-password) | Yes | Yes |  |  |  |  |
| [**keyring-migration-port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_keyring-migration-port) | Yes | Yes |  |  |  |  |
| [**keyring-migration-socket**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_keyring-migration-socket) | Yes | Yes |  |  |  |  |
| [**keyring-migration-source**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_keyring-migration-source) | Yes | Yes |  |  |  |  |
| [**keyring-migration-to-component**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_keyring-migration-to-component) | Yes | Yes |  |  |  |  |
| [**keyring-migration-user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_keyring-migration-user) | Yes | Yes |  |  |  |  |
| [**keyring\_oci\_ca\_certificate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_ca_certificate) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_compartment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_compartment) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_encryption\_endpoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_encryption_endpoint) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_key\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_key_file) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_key\_fingerprint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_key_fingerprint) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_management\_endpoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_management_endpoint) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_master\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_master_key) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_secrets\_endpoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_secrets_endpoint) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_tenancy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_tenancy) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_user) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_vaults\_endpoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_vaults_endpoint) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_oci\_virtual\_vault**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_virtual_vault) | Yes | Yes | Yes |  | Global | No |
| [**keyring\_okv\_conf\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_okv_conf_dir) | Yes | Yes | Yes |  | Global | Yes |
| [**keyring\_operations**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_operations) |  |  | Yes |  | Global | Yes |
| [**language**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_language) | Yes | Yes | Yes |  | Global | No |
| [**large\_files\_support**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_large_files_support) |  |  | Yes |  | Global | No |
| [**large\_page\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_large_page_size) |  |  | Yes |  | Global | No |
| [**large\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_large-pages) | Yes | Yes | Yes |  | Global | No |
| [**last\_insert\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_last_insert_id) |  |  | Yes |  | Session | Yes |
| [**Last\_query\_cost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Last_query_cost) |  |  |  | Yes | Session | No |
| [**Last\_query\_partial\_plans**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Last_query_partial_plans) |  |  |  | Yes | Session | No |
| [**lc\_messages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_lc-messages) | Yes | Yes | Yes |  | Both | Yes |
| [**lc\_messages\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_lc-messages-dir) | Yes | Yes | Yes |  | Global | No |
| [**lc\_time\_names**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_time_names) | Yes | Yes | Yes |  | Both | Yes |
| [**license**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_license) |  |  | Yes |  | Global | No |
| [**local\_infile**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_local_infile) | Yes | Yes | Yes |  | Global | Yes |
| [**local-service**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_local-service) | Yes |  |  |  |  |  |
| [**lock\_order**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_debug\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_loop) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_debug\_missing\_arc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_arc) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_debug\_missing\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_key) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_debug\_missing\_unlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_unlock) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_dependencies**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_dependencies) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_extra\_dependencies**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_extra_dependencies) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_output\_directory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_output_directory) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_print\_txt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_print_txt) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_trace\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_loop) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_trace\_missing\_arc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_arc) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_trace\_missing\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_key) | Yes | Yes | Yes |  | Global | No |
| [**lock\_order\_trace\_missing\_unlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_unlock) | Yes | Yes | Yes |  | Global | No |
| [**lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_wait_timeout) | Yes | Yes | Yes |  | Both | Yes |
| [**Locked\_connects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Locked_connects) |  |  |  | Yes | Global | No |
| [**locked\_in\_memory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_locked_in_memory) |  |  | Yes |  | Global | No |
| [**log-bin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_log-bin) | Yes | Yes |  |  |  |  |
| [**log\_bin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin) |  |  | Yes |  | Global | No |
| [**log\_bin\_basename**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin_basename) |  |  | Yes |  | Global | No |
| [**log\_bin\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_log-bin-index) | Yes | Yes | Yes |  | Global | No |
| [**log\_bin\_trust\_function\_creators**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin_trust_function_creators) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_bin\_use\_v1\_row\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin_use_v1_row_events) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_error**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) | Yes | Yes | Yes |  | Global | No |
| [**log\_error\_services**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_services) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_error\_suppression\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_suppression_list) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_error\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_verbosity) | Yes | Yes | Yes |  | Global | Yes |
| [**log-isam**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-isam) | Yes | Yes |  |  |  |  |
| [**log\_output**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_output) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_queries\_not\_using\_indexes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_queries_not_using_indexes) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_raw**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-raw) | Yes | Yes | Yes |  | Global | Yes |
| [**log-short-format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-short-format) | Yes | Yes |  |  |  |  |
| [**log\_slave\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_slave_updates) | Yes | Yes | Yes |  | Global | No |
| [**log\_slow\_admin\_statements**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_slow_admin_statements) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_slow\_extra**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_slow_extra) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_slow\_slave\_statements**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_slow_slave_statements) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_statements\_unsafe\_for\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_statements_unsafe_for_binlog) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_syslog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_syslog\_facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_facility) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_syslog\_include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_include_pid) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_syslog\_tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_tag) | Yes | Yes | Yes |  | Global | Yes |
| [**log-tc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-tc) | Yes | Yes |  |  |  |  |
| [**log-tc-size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-tc-size) | Yes | Yes |  |  |  |  |
| [**log\_throttle\_queries\_not\_using\_indexes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_throttle_queries_not_using_indexes) | Yes | Yes | Yes |  | Global | Yes |
| [**log\_timestamps**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_timestamps) | Yes | Yes | Yes |  | Global | Yes |
| [**long\_query\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_long_query_time) | Yes | Yes | Yes |  | Both | Yes |
| [**low\_priority\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_low_priority_updates) | Yes | Yes | Yes |  | Both | Yes |
| [**lower\_case\_file\_system**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lower_case_file_system) |  |  | Yes |  | Global | No |
| [**lower\_case\_table\_names**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lower_case_table_names) | Yes | Yes | Yes |  | Global | No |
| [**mandatory\_roles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mandatory_roles) | Yes | Yes | Yes |  | Global | Yes |
| [**master-info-file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_master-info-file) | Yes | Yes |  |  |  |  |
| [**master\_info\_repository**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_master_info_repository) | Yes | Yes | Yes |  | Global | Yes |
| [**master-retry-count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_master-retry-count) | Yes | Yes |  |  |  |  |
| [**master\_verify\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_master_verify_checksum) | Yes | Yes | Yes |  | Global | Yes |
| [**max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_allowed_packet) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_binlog\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_cache_size) | Yes | Yes | Yes |  | Global | Yes |
| [**max-binlog-dump-events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_max-binlog-dump-events) | Yes | Yes |  |  |  |  |
| [**max\_binlog\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_size) | Yes | Yes | Yes |  | Global | Yes |
| [**max\_binlog\_stmt\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_stmt_cache_size) | Yes | Yes | Yes |  | Global | Yes |
| [**max\_connect\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_connect_errors) | Yes | Yes | Yes |  | Global | Yes |
| [**max\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_connections) | Yes | Yes | Yes |  | Global | Yes |
| [**max\_delayed\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_delayed_threads) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_digest\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_digest_length) | Yes | Yes | Yes |  | Global | No |
| [**max\_error\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_error_count) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_execution\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_execution_time) | Yes | Yes | Yes |  | Both | Yes |
| [**Max\_execution\_time\_exceeded**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_execution_time_exceeded) |  |  |  | Yes | Both | No |
| [**Max\_execution\_time\_set**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_execution_time_set) |  |  |  | Yes | Both | No |
| [**Max\_execution\_time\_set\_failed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_execution_time_set_failed) |  |  |  | Yes | Both | No |
| [**max\_heap\_table\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_heap_table_size) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_insert\_delayed\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_insert_delayed_threads) |  |  | Yes |  | Both | Yes |
| [**max\_join\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_join_size) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_length\_for\_sort\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_length_for_sort_data) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_points\_in\_geometry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_points_in_geometry) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_prepared\_stmt\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_prepared_stmt_count) | Yes | Yes | Yes |  | Global | Yes |
| [**max\_relay\_log\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_relay_log_size) | Yes | Yes | Yes |  | Global | Yes |
| [**max\_seeks\_for\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_seeks_for_key) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_sort\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_sort_length) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_sp\_recursion\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_sp_recursion_depth) | Yes | Yes | Yes |  | Both | Yes |
| [**Max\_used\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_used_connections) |  |  |  | Yes | Global | No |
| [**Max\_used\_connections\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_used_connections_time) |  |  |  | Yes | Global | No |
| [**max\_user\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_user_connections) | Yes | Yes | Yes |  | Both | Yes |
| [**max\_write\_lock\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_write_lock_count) | Yes | Yes | Yes |  | Global | Yes |
| [**mecab\_charset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_mecab_charset) |  |  |  | Yes | Global | No |
| [**mecab\_rc\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mecab_rc_file) | Yes | Yes | Yes |  | Global | No |
| [**memlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_memlock) | Yes | Yes |  |  |  |  |
| - Variable: **[locked\_in\_memory](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_locked_in_memory)** |  |  |  |  |  |  |
| [**metadata\_locks\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_metadata_locks_cache_size) | Yes | Yes | Yes |  | Global | No |
| [**metadata\_locks\_hash\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_metadata_locks_hash_instances) | Yes | Yes | Yes |  | Global | No |
| [**min\_examined\_row\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_min_examined_row_limit) | Yes | Yes | Yes |  | Both | Yes |
| [**myisam-block-size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_myisam-block-size) | Yes | Yes |  |  |  |  |
| [**myisam\_data\_pointer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_data_pointer_size) | Yes | Yes | Yes |  | Global | Yes |
| [**myisam\_max\_sort\_file\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_max_sort_file_size) | Yes | Yes | Yes |  | Global | Yes |
| [**myisam\_mmap\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_mmap_size) | Yes | Yes | Yes |  | Global | No |
| [**myisam\_recover\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_recover_options) | Yes | Yes | Yes |  | Global | No |
| [**myisam\_repair\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_repair_threads) | Yes | Yes | Yes |  | Both | Yes |
| [**myisam\_sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_sort_buffer_size) | Yes | Yes | Yes |  | Both | Yes |
| [**myisam\_stats\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_stats_method) | Yes | Yes | Yes |  | Both | Yes |
| [**myisam\_use\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_use_mmap) | Yes | Yes | Yes |  | Global | Yes |
| [**mysql\_firewall\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_mysql_firewall_mode) | Yes | Yes | Yes |  | Global | Yes |
| [**mysql\_firewall\_trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_mysql_firewall_trace) | Yes | Yes | Yes |  | Global | Yes |
| [**mysql\_native\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mysql_native_password_proxy_users) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#option_mysqld_mysqlx) | Yes | Yes |  |  |  |  |
| [**Mysqlx\_aborted\_clients**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_aborted_clients) |  |  |  | Yes | Global | No |
| [**Mysqlx\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_address) |  |  |  | Yes | Global | No |
| [**mysqlx\_bind\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_bind_address) | Yes | Yes | Yes |  | Global | No |
| [**Mysqlx\_bytes\_received**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_received) |  |  |  | Yes | Both | No |
| [**Mysqlx\_bytes\_received\_compressed\_payload**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_received_compressed_payload) |  |  |  | Yes | Both | No |
| [**Mysqlx\_bytes\_received\_uncompressed\_frame**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_received_uncompressed_frame) |  |  |  | Yes | Both | No |
| [**Mysqlx\_bytes\_sent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_sent) |  |  |  | Yes | Both | No |
| [**Mysqlx\_bytes\_sent\_compressed\_payload**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_sent_compressed_payload) |  |  |  | Yes | Both | No |
| [**Mysqlx\_bytes\_sent\_uncompressed\_frame**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_sent_uncompressed_frame) |  |  |  | Yes | Both | No |
| [**Mysqlx\_compression\_algorithm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_compression_algorithm) |  |  |  | Yes | Session | No |
| [**mysqlx\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_compression_algorithms) | Yes | Yes | Yes |  | Global | Yes |
| [**Mysqlx\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_compression_level) |  |  |  | Yes | Session | No |
| [**mysqlx\_connect\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_connect_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**Mysqlx\_connection\_accept\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connection_accept_errors) |  |  |  | Yes | Both | No |
| [**Mysqlx\_connection\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connection_errors) |  |  |  | Yes | Both | No |
| [**Mysqlx\_connections\_accepted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connections_accepted) |  |  |  | Yes | Global | No |
| [**Mysqlx\_connections\_closed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connections_closed) |  |  |  | Yes | Global | No |
| [**Mysqlx\_connections\_rejected**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connections_rejected) |  |  |  | Yes | Global | No |
| [**Mysqlx\_crud\_create\_view**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_create_view) |  |  |  | Yes | Both | No |
| [**Mysqlx\_crud\_delete**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_delete) |  |  |  | Yes | Both | No |
| [**Mysqlx\_crud\_drop\_view**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_drop_view) |  |  |  | Yes | Both | No |
| [**Mysqlx\_crud\_find**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_find) |  |  |  | Yes | Both | No |
| [**Mysqlx\_crud\_insert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_insert) |  |  |  | Yes | Both | No |
| [**Mysqlx\_crud\_modify\_view**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_modify_view) |  |  |  | Yes | Both | No |
| [**Mysqlx\_crud\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_update) |  |  |  | Yes | Both | No |
| [**Mysqlx\_cursor\_close**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_cursor_close) |  |  |  | Yes | Both | No |
| [**Mysqlx\_cursor\_fetch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_cursor_fetch) |  |  |  | Yes | Both | No |
| [**Mysqlx\_cursor\_open**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_cursor_open) |  |  |  | Yes | Both | No |
| [**mysqlx\_deflate\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_deflate_default_compression_level) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx\_deflate\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_deflate_max_client_compression_level) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx\_document\_id\_unique\_prefix**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_document_id_unique_prefix) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx\_enable\_hello\_notice**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_enable_hello_notice) | Yes | Yes | Yes |  | Global | Yes |
| [**Mysqlx\_errors\_sent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_errors_sent) |  |  |  | Yes | Both | No |
| Mysqlx\_errors\_unknown\_message\_type |  |  |  | Yes | Both | No |
| [**Mysqlx\_expect\_close**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_expect_close) |  |  |  | Yes | Both | No |
| [**Mysqlx\_expect\_open**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_expect_open) |  |  |  | Yes | Both | No |
| [**mysqlx\_idle\_worker\_thread\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_idle_worker_thread_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**Mysqlx\_init\_error**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_init_error) |  |  |  | Yes | Both | No |
| [**mysqlx\_interactive\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_interactive_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx\_lz4\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_lz4_default_compression_level) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx\_lz4\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_lz4_max_client_compression_level) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx\_max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_max_allowed_packet) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx\_max\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_max_connections) | Yes | Yes | Yes |  | Global | Yes |
| [**Mysqlx\_messages\_sent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_messages_sent) |  |  |  | Yes | Both | No |
| [**mysqlx\_min\_worker\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_min_worker_threads) | Yes | Yes | Yes |  | Global | Yes |
| [**Mysqlx\_notice\_global\_sent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_notice_global_sent) |  |  |  | Yes | Both | No |
| [**Mysqlx\_notice\_other\_sent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_notice_other_sent) |  |  |  | Yes | Both | No |
| [**Mysqlx\_notice\_warning\_sent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_notice_warning_sent) |  |  |  | Yes | Both | No |
| [**Mysqlx\_notified\_by\_group\_replication**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_notified_by_group_replication) |  |  |  | Yes | Both | No |
| [**Mysqlx\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_port) |  |  |  | Yes | Global | No |
| [**mysqlx\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_port) | Yes | Yes | Yes |  | Global | No |
| [**mysqlx\_port\_open\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_port_open_timeout) | Yes | Yes | Yes |  | Global | No |
| [**Mysqlx\_prep\_deallocate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_prep_deallocate) |  |  |  | Yes | Both | No |
| [**Mysqlx\_prep\_execute**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_prep_execute) |  |  |  | Yes | Both | No |
| [**Mysqlx\_prep\_prepare**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_prep_prepare) |  |  |  | Yes | Both | No |
| [**mysqlx\_read\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_read_timeout) | Yes | Yes | Yes |  | Session | Yes |
| [**Mysqlx\_rows\_sent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_rows_sent) |  |  |  | Yes | Both | No |
| [**Mysqlx\_sessions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions) |  |  |  | Yes | Global | No |
| [**Mysqlx\_sessions\_accepted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_accepted) |  |  |  | Yes | Global | No |
| [**Mysqlx\_sessions\_closed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_closed) |  |  |  | Yes | Global | No |
| [**Mysqlx\_sessions\_fatal\_error**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_fatal_error) |  |  |  | Yes | Global | No |
| [**Mysqlx\_sessions\_killed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_killed) |  |  |  | Yes | Global | No |
| [**Mysqlx\_sessions\_rejected**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_rejected) |  |  |  | Yes | Global | No |
| [**Mysqlx\_socket**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_socket) |  |  |  | Yes | Global | No |
| [**mysqlx\_socket**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_socket) | Yes | Yes | Yes |  | Global | No |
| [**Mysqlx\_ssl\_accept\_renegotiates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_accept_renegotiates) |  |  |  | Yes | Global | No |
| [**Mysqlx\_ssl\_accepts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_accepts) |  |  |  | Yes | Global | No |
| [**Mysqlx\_ssl\_active**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_active) |  |  |  | Yes | Both | No |
| [**mysqlx\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_ca) | Yes | Yes | Yes |  | Global | No |
| [**mysqlx\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_capath) | Yes | Yes | Yes |  | Global | No |
| [**mysqlx\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_cert) | Yes | Yes | Yes |  | Global | No |
| [**Mysqlx\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_cipher) |  |  |  | Yes | Both | No |
| [**mysqlx\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_cipher) | Yes | Yes | Yes |  | Global | No |
| [**Mysqlx\_ssl\_cipher\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_cipher_list) |  |  |  | Yes | Both | No |
| [**mysqlx\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_crl) | Yes | Yes | Yes |  | Global | No |
| [**mysqlx\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_crlpath) | Yes | Yes | Yes |  | Global | No |
| [**Mysqlx\_ssl\_ctx\_verify\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_ctx_verify_depth) |  |  |  | Yes | Both | No |
| [**Mysqlx\_ssl\_ctx\_verify\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_ctx_verify_mode) |  |  |  | Yes | Both | No |
| [**Mysqlx\_ssl\_finished\_accepts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_finished_accepts) |  |  |  | Yes | Global | No |
| [**mysqlx\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_key) | Yes | Yes | Yes |  | Global | No |
| [**Mysqlx\_ssl\_server\_not\_after**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_server_not_after) |  |  |  | Yes | Global | No |
| [**Mysqlx\_ssl\_server\_not\_before**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_server_not_before) |  |  |  | Yes | Global | No |
| [**Mysqlx\_ssl\_verify\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_verify_depth) |  |  |  | Yes | Global | No |
| [**Mysqlx\_ssl\_verify\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_verify_mode) |  |  |  | Yes | Global | No |
| [**Mysqlx\_ssl\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_version) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_create\_collection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_create_collection) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_create\_collection\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_create_collection_index) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_disable\_notices**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_disable_notices) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_drop\_collection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_drop_collection) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_drop\_collection\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_drop_collection_index) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_enable\_notices**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_enable_notices) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_ensure\_collection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_ensure_collection) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_execute\_mysqlx**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_execute_mysqlx) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_execute\_sql**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_execute_sql) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_execute\_xplugin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_execute_xplugin) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_get\_collection\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_get_collection_options) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_kill\_client**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_kill_client) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_list\_clients**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_list_clients) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_list\_notices**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_list_notices) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_list\_objects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_list_objects) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_modify\_collection\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_modify_collection_options) |  |  |  | Yes | Both | No |
| [**Mysqlx\_stmt\_ping**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_ping) |  |  |  | Yes | Both | No |
| [**mysqlx\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_wait_timeout) | Yes | Yes | Yes |  | Session | Yes |
| [**Mysqlx\_worker\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_worker_threads) |  |  |  | Yes | Global | No |
| [**Mysqlx\_worker\_threads\_active**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_worker_threads_active) |  |  |  | Yes | Global | No |
| [**mysqlx\_write\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_write_timeout) | Yes | Yes | Yes |  | Session | Yes |
| [**mysqlx\_zstd\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_zstd_default_compression_level) | Yes | Yes | Yes |  | Global | Yes |
| [**mysqlx\_zstd\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_zstd_max_client_compression_level) | Yes | Yes | Yes |  | Global | Yes |
| [**named\_pipe**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_named_pipe) | Yes | Yes | Yes |  | Global | No |
| [**named\_pipe\_full\_access\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_named_pipe_full_access_group) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_allow\_copying\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-allow-copying-alter-table) | Yes | Yes | Yes |  | Both | Yes |
| [**Ndb\_api\_adaptive\_send\_deferred\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_deferred_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_deferred\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_deferred_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_deferred\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_deferred_count_session) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_deferred\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_deferred_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_forced\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_forced_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_forced\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_forced_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_forced\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_forced_count_session) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_forced\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_forced_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_unforced\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_unforced_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_unforced\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_unforced_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_unforced\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_unforced_count_session) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_adaptive\_send\_unforced\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_unforced_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_bytes\_received\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_received_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_bytes\_received\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_received_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_bytes\_received\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_received_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_bytes\_received\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_received_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_bytes\_sent\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_sent_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_bytes\_sent\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_sent_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_bytes\_sent\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_sent_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_bytes\_sent\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_sent_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_event\_bytes\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_bytes_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_event\_bytes\_count\_injector**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_bytes_count_injector) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_event\_data\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_data_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_event\_data\_count\_injector**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_data_count_injector) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_event\_nondata\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_nondata_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_event\_nondata\_count\_injector**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_nondata_count_injector) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_pk\_op\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pk_op_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_pk\_op\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pk_op_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_pk\_op\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pk_op_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_pk\_op\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pk_op_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_pruned\_scan\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pruned_scan_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_pruned\_scan\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pruned_scan_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_pruned\_scan\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pruned_scan_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_pruned\_scan\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pruned_scan_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_range\_scan\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_range_scan_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_range\_scan\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_range_scan_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_range\_scan\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_range_scan_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_range\_scan\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_range_scan_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_read\_row\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_read_row_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_read\_row\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_read_row_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_read\_row\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_read_row_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_read\_row\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_read_row_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_scan\_batch\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_scan_batch_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_scan\_batch\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_scan_batch_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_scan\_batch\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_scan_batch_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_scan\_batch\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_scan_batch_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_table\_scan\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_table_scan_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_table\_scan\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_table_scan_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_table\_scan\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_table_scan_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_table\_scan\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_table_scan_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_abort\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_abort_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_abort\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_abort_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_abort\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_abort_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_trans\_abort\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_abort_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_close\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_close_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_close\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_close_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_close\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_close_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_trans\_close\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_close_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_commit\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_commit_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_commit\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_commit_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_commit\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_commit_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_trans\_commit\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_commit_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_local\_read\_row\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_local_read_row_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_local\_read\_row\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_local_read_row_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_local\_read\_row\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_local_read_row_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_trans\_local\_read\_row\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_local_read_row_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_start\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_start_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_start\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_start_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_trans\_start\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_start_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_trans\_start\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_start_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_uk\_op\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_uk_op_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_uk\_op\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_uk_op_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_uk\_op\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_uk_op_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_uk\_op\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_uk_op_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_exec\_complete\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_exec_complete_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_exec\_complete\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_exec_complete_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_exec\_complete\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_exec_complete_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_wait\_exec\_complete\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_exec_complete_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_meta\_request\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_meta_request_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_meta\_request\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_meta_request_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_meta\_request\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_meta_request_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_wait\_meta\_request\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_meta_request_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_nanos\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_nanos_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_nanos\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_nanos_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_nanos\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_nanos_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_wait\_nanos\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_nanos_count_slave) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_scan\_result\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_scan_result_count) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_scan\_result\_count\_replica**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_scan_result_count_replica) |  |  |  | Yes | Global | No |
| [**Ndb\_api\_wait\_scan\_result\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_scan_result_count_session) |  |  |  | Yes | Session | No |
| [**Ndb\_api\_wait\_scan\_result\_count\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_scan_result_count_slave) |  |  |  | Yes | Global | No |
| [**ndb\_autoincrement\_prefetch\_sz**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_autoincrement_prefetch_sz) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-batch-size) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_blob\_read\_batch\_bytes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-blob-read-batch-bytes) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_blob\_write\_batch\_bytes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-blob-write-batch-bytes) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_cache\_check\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_cache_check_time) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_clear\_apply\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_clear_apply_status) | Yes |  | Yes |  | Global | Yes |
| [**ndb\_cluster\_connection\_pool**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-cluster-connection-pool) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_cluster\_connection\_pool\_nodeids**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-cluster-connection-pool-nodeids) | Yes | Yes | Yes |  | Global | No |
| [**Ndb\_cluster\_node\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_cluster_node_id) |  |  |  | Yes | Global | No |
| [**Ndb\_config\_from\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_config_from_host) |  |  |  | Yes | Both | No |
| [**Ndb\_config\_from\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_config_from_port) |  |  |  | Yes | Both | No |
| [**Ndb\_config\_generation**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_config_generation) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_fn\_epoch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_epoch) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_fn\_epoch\_trans**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_epoch_trans) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_fn\_epoch2**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_epoch2) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_fn\_epoch2\_trans**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_epoch2_trans) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_fn\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_max) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_fn\_old**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_old) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_last\_conflict\_epoch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_last_conflict_epoch) |  |  | Yes |  | Global | No |
| [**Ndb\_conflict\_last\_stable\_epoch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_last_stable_epoch) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_reflected\_op\_discard\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_reflected_op_discard_count) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_reflected\_op\_prepare\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_reflected_op_prepare_count) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_refresh\_op\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_refresh_op_count) |  |  |  | Yes | Global | No |
| [**ndb\_conflict\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_conflict_role) | Yes | Yes | Yes |  | Global | Yes |
| [**Ndb\_conflict\_trans\_conflict\_commit\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_conflict_commit_count) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_trans\_detect\_iter\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_detect_iter_count) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_trans\_reject\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_reject_count) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_trans\_row\_conflict\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_row_conflict_count) |  |  |  | Yes | Global | No |
| [**Ndb\_conflict\_trans\_row\_reject\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_row_reject_count) |  |  |  | Yes | Global | No |
| [**ndb-connectstring**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-connectstring) | Yes | Yes |  |  |  |  |
| [**ndb\_data\_node\_neighbour**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_data_node_neighbour) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_dbg\_check\_shares**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_dbg_check_shares) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_default\_column\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-default-column-format) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_default\_column\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_default_column_format) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_deferred\_constraints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-deferred-constraints) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_deferred\_constraints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_deferred_constraints) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_distribution**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-distribution) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_distribution**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_distribution) | Yes | Yes | Yes |  | Global | Yes |
| [**Ndb\_epoch\_delete\_delete\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_epoch_delete_delete_count) |  |  |  | Yes | Global | No |
| [**ndb\_eventbuffer\_free\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_eventbuffer_free_percent) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_eventbuffer\_max\_alloc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_eventbuffer_max_alloc) | Yes | Yes | Yes |  | Global | Yes |
| [**Ndb\_execute\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_execute_count) |  |  |  | Yes | Global | No |
| [**ndb\_extra\_logging**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_extra_logging) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_force\_send**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_force_send) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_fully\_replicated**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_fully_replicated) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_index\_stat\_enable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_index_stat_enable) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_index\_stat\_option**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_index_stat_option) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_join\_pushdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_join_pushdown) |  |  | Yes |  | Both | Yes |
| [**Ndb\_last\_commit\_epoch\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_last_commit_epoch_server) |  |  |  | Yes | Global | No |
| [**Ndb\_last\_commit\_epoch\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_last_commit_epoch_session) |  |  |  | Yes | Session | No |
| [**ndb\_log\_apply\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-apply-status) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_log\_apply\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_apply_status) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_log\_bin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_bin) | Yes |  | Yes |  | Both | No |
| [**ndb\_log\_binlog\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_binlog_index) | Yes |  | Yes |  | Global | Yes |
| [**ndb\_log\_empty\_epochs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-empty-epochs) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_log\_empty\_epochs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_empty_epochs) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_log\_empty\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-empty-update) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_log\_empty\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_empty_update) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_log\_exclusive\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-exclusive-reads) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_log\_exclusive\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_exclusive_reads) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_log\_fail\_terminate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-fail-terminate) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_log\_orig**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-orig) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_log\_orig**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_orig) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_log\_transaction\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-transaction-id) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_log\_transaction\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_transaction_id) |  |  | Yes |  | Global | No |
| [**ndb\_log\_update\_as\_write**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-update-as-write) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_log\_update\_minimal**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-update-minimal) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_log\_updated\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-updated-only) | Yes | Yes | Yes |  | Global | Yes |
| [**Ndb\_metadata\_blacklist\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_metadata_excluded_count) |  |  |  | Yes | Global | No |
| [**ndb\_metadata\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_check) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_metadata\_check\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_check_interval) | Yes | Yes | Yes |  | Global | Yes |
| [**Ndb\_metadata\_detected\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_metadata_detected_count) |  |  |  | Yes | Global | No |
| [**Ndb\_metadata\_excluded\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_metadata_excluded_count) |  |  |  | Yes | Global | No |
| [**ndb\_metadata\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_sync) |  |  | Yes |  | Global | Yes |
| [**Ndb\_metadata\_synced\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_metadata_synced_count) |  |  |  | Yes | Global | No |
| [**ndb-mgmd-host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-mgmd-host) | Yes | Yes |  |  |  |  |
| [**ndb\_nodeid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-nodeid) | Yes | Yes |  | Yes | Global | No |
| [**Ndb\_number\_of\_data\_nodes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_number_of_data_nodes) |  |  |  | Yes | Global | No |
| [**ndb\_optimization\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-optimization-delay) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb-optimized-node-selection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-optimized-node-selection) | Yes |  |  |  |  |  |
| [**ndb\_optimized\_node\_selection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_optimized_node_selection) | Yes | Yes | Yes |  | Global | No |
| [**Ndb\_pruned\_scan\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pruned_scan_count) |  |  |  | Yes | Global | No |
| [**Ndb\_pushed\_queries\_defined**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pushed_queries_defined) |  |  |  | Yes | Global | No |
| [**Ndb\_pushed\_queries\_dropped**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pushed_queries_dropped) |  |  |  | Yes | Global | No |
| [**Ndb\_pushed\_queries\_executed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pushed_queries_executed) |  |  |  | Yes | Global | No |
| [**Ndb\_pushed\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pushed_reads) |  |  |  | Yes | Global | No |
| [**ndb\_read\_backup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_read_backup) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_recv\_thread\_activation\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_recv_thread_activation_threshold) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_recv\_thread\_cpu\_mask**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_recv_thread_cpu_mask) | Yes | Yes | Yes |  | Global | Yes |
| [**Ndb\_replica\_max\_replicated\_epoch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_replica_max_replicated_epoch) |  |  | Yes |  | Global | No |
| [**ndb\_report\_thresh\_binlog\_epoch\_slip**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_report_thresh_binlog_epoch_slip) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_report\_thresh\_binlog\_mem\_usage**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_report_thresh_binlog_mem_usage) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_row\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_row_checksum) |  |  | Yes |  | Both | Yes |
| [**Ndb\_scan\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_scan_count) |  |  |  | Yes | Global | No |
| [**ndb\_schema\_dist\_lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_schema_dist_lock_wait_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_schema\_dist\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-schema-dist-timeout) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_schema\_dist\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_schema_dist_timeout) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_schema\_dist\_upgrade\_allowed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_schema_dist_upgrade_allowed) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_show\_foreign\_key\_mock\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_show_foreign_key_mock_tables) | Yes | Yes | Yes |  | Global | Yes |
| [**ndb\_slave\_conflict\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_slave_conflict_role) | Yes | Yes | Yes |  | Global | Yes |
| [**Ndb\_slave\_max\_replicated\_epoch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_slave_max_replicated_epoch) |  |  | Yes |  | Global | No |
| [**Ndb\_system\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_system_name) |  |  | Yes |  | Global | No |
| [**ndb\_table\_no\_logging**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_table_no_logging) |  |  | Yes |  | Session | Yes |
| [**ndb\_table\_temporary**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_table_temporary) |  |  | Yes |  | Session | Yes |
| [**Ndb\_trans\_hint\_count\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_trans_hint_count_session) |  |  |  | Yes | Both | No |
| [**ndb-transid-mysql-connection-map**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-transid-mysql-connection-map) | Yes |  |  |  |  |  |
| [**ndb\_use\_copying\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_use_copying_alter_table) |  |  | Yes |  | Both | No |
| [**ndb\_use\_exact\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_use_exact_count) |  |  | Yes |  | Both | Yes |
| [**ndb\_use\_transactions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_use_transactions) | Yes | Yes | Yes |  | Both | Yes |
| [**ndb\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_version) |  |  | Yes |  | Global | No |
| [**ndb\_version\_string**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_version_string) |  |  | Yes |  | Global | No |
| [**ndb\_wait\_connected**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-wait-connected) | Yes | Yes | Yes |  | Global | No |
| [**ndb\_wait\_setup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-wait-setup) | Yes | Yes | Yes |  | Global | No |
| [**ndbcluster**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndbcluster) | Yes | Yes |  |  |  |  |
| [**ndbinfo**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndbinfo) | Yes |  |  |  |  |  |
| [**ndbinfo\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_database) |  |  | Yes |  | Global | No |
| [**ndbinfo\_max\_bytes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_max_bytes) | Yes |  | Yes |  | Both | Yes |
| [**ndbinfo\_max\_rows**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_max_rows) | Yes |  | Yes |  | Both | Yes |
| [**ndbinfo\_offline**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_offline) |  |  | Yes |  | Global | Yes |
| [**ndbinfo\_show\_hidden**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_show_hidden) | Yes |  | Yes |  | Both | Yes |
| [**ndbinfo\_table\_prefix**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_table_prefix) |  |  | Yes |  | Global | No |
| [**ndbinfo\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_version) |  |  | Yes |  | Global | No |
| [**net\_buffer\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_buffer_length) | Yes | Yes | Yes |  | Both | Yes |
| [**net\_read\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_read_timeout) | Yes | Yes | Yes |  | Both | Yes |
| [**net\_retry\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_retry_count) | Yes | Yes | Yes |  | Both | Yes |
| [**net\_write\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_write_timeout) | Yes | Yes | Yes |  | Both | Yes |
| [**new**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_new) | Yes | Yes | Yes |  | Both | Yes |
| [**ngram\_token\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ngram_token_size) | Yes | Yes | Yes |  | Global | No |
| [**no-dd-upgrade**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_no-dd-upgrade) | Yes | Yes |  |  |  |  |
| [**no-defaults**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_no-defaults) | Yes |  |  |  |  |  |
| [**no-monitor**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_no-monitor) | Yes | Yes |  |  |  |  |
| [**Not\_flushed\_delayed\_rows**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Not_flushed_delayed_rows) |  |  |  | Yes | Global | No |
| [**offline\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_offline_mode) | Yes | Yes | Yes |  | Global | Yes |
| [**old**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old) | Yes | Yes | Yes |  | Global | No |
| [**old\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old_alter_table) | Yes | Yes | Yes |  | Both | Yes |
| [**old-style-user-limits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_old-style-user-limits) | Yes | Yes |  |  |  |  |
| [**Ongoing\_anonymous\_gtid\_violating\_transaction\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ongoing_anonymous_gtid_violating_transaction_count) |  |  |  | Yes | Global | No |
| [**Ongoing\_anonymous\_transaction\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ongoing_anonymous_transaction_count) |  |  |  | Yes | Global | No |
| [**Ongoing\_automatic\_gtid\_violating\_transaction\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ongoing_automatic_gtid_violating_transaction_count) |  |  |  | Yes | Global | No |
| [**Open\_files**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Open_files) |  |  |  | Yes | Global | No |
| [**open\_files\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_open_files_limit) | Yes | Yes | Yes |  | Global | No |
| [**Open\_streams**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Open_streams) |  |  |  | Yes | Global | No |
| [**Open\_table\_definitions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Open_table_definitions) |  |  |  | Yes | Global | No |
| [**Open\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Open_tables) |  |  |  | Yes | Both | No |
| [**Opened\_files**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Opened_files) |  |  |  | Yes | Global | No |
| [**Opened\_table\_definitions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Opened_table_definitions) |  |  |  | Yes | Both | No |
| [**Opened\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Opened_tables) |  |  |  | Yes | Both | No |
| [**optimizer\_prune\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_prune_level) | Yes | Yes | Yes |  | Both | Yes |
| [**optimizer\_search\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_search_depth) | Yes | Yes | Yes |  | Both | Yes |
| [**optimizer\_switch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_switch) | Yes | Yes | Yes |  | Both | Yes |
| [**optimizer\_trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace) | Yes | Yes | Yes |  | Both | Yes |
| [**optimizer\_trace\_features**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_features) | Yes | Yes | Yes |  | Both | Yes |
| [**optimizer\_trace\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_limit) | Yes | Yes | Yes |  | Both | Yes |
| [**optimizer\_trace\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_max_mem_size) | Yes | Yes | Yes |  | Both | Yes |
| [**optimizer\_trace\_offset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_offset) | Yes | Yes | Yes |  | Both | Yes |
| [**original\_commit\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_original_commit_timestamp) |  |  | Yes |  | Session | Yes |
| [**original\_server\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_original_server_version) |  |  | Yes |  | Session | Yes |
| [**parser\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_parser_max_mem_size) | Yes | Yes | Yes |  | Both | Yes |
| [**partial\_revokes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_partial_revokes) | Yes | Yes | Yes |  | Global | Yes |
| [**password\_history**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_history) | Yes | Yes | Yes |  | Global | Yes |
| [**password\_require\_current**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_require_current) | Yes | Yes | Yes |  | Global | Yes |
| [**password\_reuse\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_reuse_interval) | Yes | Yes | Yes |  | Global | Yes |
| [**performance\_schema**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema) | Yes | Yes | Yes |  | Global | No |
| [**Performance\_schema\_accounts\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_accounts_lost) |  |  |  | Yes | Global | No |
| [**performance\_schema\_accounts\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_accounts_size) | Yes | Yes | Yes |  | Global | No |
| [**Performance\_schema\_cond\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_cond_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_cond\_instances\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_cond_instances_lost) |  |  |  | Yes | Global | No |
| [**performance-schema-consumer-events-stages-current**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-stages-current) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-stages-history**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-stages-history) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-stages-history-long**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-stages-history-long) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-statements-current**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-statements-current) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-statements-history**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-statements-history) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-statements-history-long**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-statements-history-long) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-transactions-current**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-transactions-current) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-transactions-history**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-transactions-history) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-transactions-history-long**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-transactions-history-long) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-waits-current**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-waits-current) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-waits-history**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-waits-history) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-events-waits-history-long**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-events-waits-history-long) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-global-instrumentation**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-global-instrumentation) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-statements-digest**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-statements-digest) | Yes | Yes |  |  |  |  |
| [**performance-schema-consumer-thread-instrumentation**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-consumer-thread-instrumentation) | Yes | Yes |  |  |  |  |
| [**Performance\_schema\_digest\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_digest_lost) |  |  |  | Yes | Global | No |
| [**performance\_schema\_digests\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_digests_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_error\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_error_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_events\_stages\_history\_long\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_stages_history_long_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_events\_stages\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_stages_history_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_events\_statements\_history\_long\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_statements_history_long_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_events\_statements\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_statements_history_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_events\_transactions\_history\_long\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_transactions_history_long_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_events\_transactions\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_transactions_history_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_events\_waits\_history\_long\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_waits_history_long_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_events\_waits\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_waits_history_size) | Yes | Yes | Yes |  | Global | No |
| [**Performance\_schema\_file\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_file_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_file\_handles\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_file_handles_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_file\_instances\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_file_instances_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_hosts\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_hosts_lost) |  |  |  | Yes | Global | No |
| [**performance\_schema\_hosts\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_hosts_size) | Yes | Yes | Yes |  | Global | No |
| [**Performance\_schema\_index\_stat\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_index_stat_lost) |  |  |  | Yes | Global | No |
| [**performance-schema-instrument**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#option_mysqld_performance-schema-instrument) | Yes | Yes |  |  |  |  |
| [**Performance\_schema\_locker\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_locker_lost) |  |  |  | Yes | Global | No |
| [**performance\_schema\_max\_cond\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_cond_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_cond\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_cond_instances) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_digest\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_digest_length) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_digest\_sample\_age**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_digest_sample_age) | Yes | Yes | Yes |  | Global | Yes |
| [**performance\_schema\_max\_file\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_file_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_file\_handles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_file_handles) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_file\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_file_instances) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_index\_stat**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_index_stat) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_memory\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_memory_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_metadata\_locks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_metadata_locks) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_mutex\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_mutex_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_mutex\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_mutex_instances) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_prepared\_statements\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_prepared_statements_instances) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_program\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_program_instances) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_rwlock\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_rwlock_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_rwlock\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_rwlock_instances) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_socket\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_socket_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_socket\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_socket_instances) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_sql\_text\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_sql_text_length) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_stage\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_stage_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_statement\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_statement_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_statement\_stack**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_statement_stack) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_table\_handles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_table_handles) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_table\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_table_instances) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_table\_lock\_stat**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_table_lock_stat) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_thread\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_thread_classes) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_max\_thread\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_thread_instances) | Yes | Yes | Yes |  | Global | No |
| [**Performance\_schema\_memory\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_memory_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_metadata\_lock\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_metadata_lock_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_mutex\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_mutex_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_mutex\_instances\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_mutex_instances_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_nested\_statement\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_nested_statement_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_prepared\_statements\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_prepared_statements_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_program\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_program_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_rwlock\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_rwlock_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_rwlock\_instances\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_rwlock_instances_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_session\_connect\_attrs\_longest\_seen**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_session_connect_attrs_longest_seen) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_session\_connect\_attrs\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_session_connect_attrs_lost) |  |  |  | Yes | Global | No |
| [**performance\_schema\_session\_connect\_attrs\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_session_connect_attrs_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_setup\_actors\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_setup_actors_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_setup\_objects\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_setup_objects_size) | Yes | Yes | Yes |  | Global | No |
| [**performance\_schema\_show\_processlist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_show_processlist) | Yes | Yes | Yes |  | Global | Yes |
| [**Performance\_schema\_socket\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_socket_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_socket\_instances\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_socket_instances_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_stage\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_stage_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_statement\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_statement_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_table\_handles\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_table_handles_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_table\_instances\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_table_instances_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_table\_lock\_stat\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_table_lock_stat_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_thread\_classes\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_thread_classes_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_thread\_instances\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_thread_instances_lost) |  |  |  | Yes | Global | No |
| [**Performance\_schema\_users\_lost**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_users_lost) |  |  |  | Yes | Global | No |
| [**performance\_schema\_users\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_users_size) | Yes | Yes | Yes |  | Global | No |
| [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) | Yes | Yes | Yes |  | Global | No |
| [**persisted\_globals\_load**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persisted_globals_load) | Yes | Yes | Yes |  | Global | No |
| [**pid\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pid_file) | Yes | Yes | Yes |  | Global | No |
| [**plugin\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_plugin_dir) | Yes | Yes | Yes |  | Global | No |
| [**plugin\_load**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load) | Yes | Yes | Yes |  | Global | No |
| [**plugin\_load\_add**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load-add) | Yes | Yes | Yes |  | Global | No |
| [**plugin-xxx**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-xxx) | Yes | Yes |  |  |  |  |
| [**port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_port) | Yes | Yes | Yes |  | Global | No |
| [**port-open-timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_port-open-timeout) | Yes | Yes |  |  |  |  |
| [**preload\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_preload_buffer_size) | Yes | Yes | Yes |  | Both | Yes |
| [**Prepared\_stmt\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Prepared_stmt_count) |  |  |  | Yes | Global | No |
| [**print-defaults**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_print-defaults) | Yes |  |  |  |  |  |
| [**print\_identified\_with\_as\_hex**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_print_identified_with_as_hex) | Yes | Yes | Yes |  | Both | Yes |
| [**profiling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_profiling) |  |  | Yes |  | Both | Yes |
| [**profiling\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_profiling_history_size) | Yes | Yes | Yes |  | Both | Yes |
| [**protocol\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_protocol_compression_algorithms) | Yes | Yes | Yes |  | Global | Yes |
| [**protocol\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_protocol_version) |  |  | Yes |  | Global | No |
| [**proxy\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_proxy_user) |  |  | Yes |  | Session | No |
| [**pseudo\_slave\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_slave_mode) |  |  | Yes |  | Session | Yes |
| [**pseudo\_thread\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_thread_id) |  |  | Yes |  | Session | Yes |
| [**Queries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Queries) |  |  |  | Yes | Both | No |
| [**query\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_query_alloc_block_size) | Yes | Yes | Yes |  | Both | Yes |
| [**query\_prealloc\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_query_prealloc_size) | Yes | Yes | Yes |  | Both | Yes |
| [**Questions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Questions) |  |  |  | Yes | Both | No |
| [**rand\_seed1**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed1) |  |  | Yes |  | Session | Yes |
| [**rand\_seed2**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed2) |  |  | Yes |  | Session | Yes |
| [**range\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_range_alloc_block_size) | Yes | Yes | Yes |  | Both | Yes |
| [**range\_optimizer\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_range_optimizer_max_mem_size) | Yes | Yes | Yes |  | Both | Yes |
| [**rbr\_exec\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rbr_exec_mode) |  |  | Yes |  | Both | Yes |
| [**read\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_buffer_size) | Yes | Yes | Yes |  | Both | Yes |
| [**read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_only) | Yes | Yes | Yes |  | Global | Yes |
| [**read\_rnd\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_rnd_buffer_size) | Yes | Yes | Yes |  | Both | Yes |
| [**regexp\_stack\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_regexp_stack_limit) | Yes | Yes | Yes |  | Global | Yes |
| [**regexp\_time\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_regexp_time_limit) | Yes | Yes | Yes |  | Global | Yes |
| [**relay\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log) | Yes | Yes | Yes |  | Global | No |
| [**relay\_log\_basename**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_basename) |  |  | Yes |  | Global | No |
| [**relay\_log\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_index) | Yes | Yes | Yes |  | Global | No |
| [**relay\_log\_info\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_info_file) | Yes | Yes | Yes |  | Global | No |
| [**relay\_log\_info\_repository**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_info_repository) | Yes | Yes | Yes |  | Global | Yes |
| [**relay\_log\_purge**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_purge) | Yes | Yes | Yes |  | Global | Yes |
| [**relay\_log\_recovery**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_recovery) | Yes | Yes | Yes |  | Global | No |
| [**relay\_log\_space\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_space_limit) | Yes | Yes | Yes |  | Global | No |
| [**remove**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_remove) | Yes |  |  |  |  |  |
| [**replicate-do-db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_replicate-do-db) | Yes | Yes |  |  |  |  |
| [**replicate-do-table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_replicate-do-table) | Yes | Yes |  |  |  |  |
| [**replicate-ignore-db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_replicate-ignore-db) | Yes | Yes |  |  |  |  |
| [**replicate-ignore-table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_replicate-ignore-table) | Yes | Yes |  |  |  |  |
| [**replicate-rewrite-db**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_replicate-rewrite-db) | Yes | Yes |  |  |  |  |
| [**replicate-same-server-id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_replicate-same-server-id) | Yes | Yes |  |  |  |  |
| [**replicate-wild-do-table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_replicate-wild-do-table) | Yes | Yes |  |  |  |  |
| [**replicate-wild-ignore-table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_replicate-wild-ignore-table) | Yes | Yes |  |  |  |  |
| [**replication\_optimize\_for\_static\_plugin\_config**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_replication_optimize_for_static_plugin_config) | Yes | Yes | Yes |  | Global | Yes |
| [**replication\_sender\_observe\_commit\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_replication_sender_observe_commit_only) | Yes | Yes | Yes |  | Global | Yes |
| [**report\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_report_host) | Yes | Yes | Yes |  | Global | No |
| [**report\_password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_report_password) | Yes | Yes | Yes |  | Global | No |
| [**report\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_report_port) | Yes | Yes | Yes |  | Global | No |
| [**report\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_report_user) | Yes | Yes | Yes |  | Global | No |
| [**require\_row\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_require_row_format) |  |  | Yes |  | Session | Yes |
| [**require\_secure\_transport**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_require_secure_transport) | Yes | Yes | Yes |  | Global | Yes |
| [**resultset\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_resultset_metadata) |  |  | Yes |  | Session | Yes |
| [**rewriter\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rewriter_enabled) |  |  | Yes |  | Global | Yes |
| [**Rewriter\_number\_loaded\_rules**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rewriter_number_loaded_rules) |  |  |  | Yes | Global | No |
| [**Rewriter\_number\_reloads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rewriter_number_reloads) |  |  |  | Yes | Global | No |
| [**Rewriter\_number\_rewritten\_queries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rewriter_number_rewritten_queries) |  |  |  | Yes | Global | No |
| [**Rewriter\_reload\_error**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rewriter_reload_error) |  |  |  | Yes | Global | No |
| [**rewriter\_verbose**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rewriter_verbose) |  |  | Yes |  | Global | Yes |
| [**rpl\_read\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_read_size) | Yes | Yes | Yes |  | Global | Yes |
| [**Rpl\_semi\_sync\_master\_clients**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_clients) |  |  |  | Yes | Global | No |
| [**rpl\_semi\_sync\_master\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_enabled) | Yes | Yes | Yes |  | Global | Yes |
| [**Rpl\_semi\_sync\_master\_net\_avg\_wait\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_net_avg_wait_time) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_net\_wait\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_net_wait_time) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_net\_waits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_net_waits) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_no\_times**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_no_times) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_no\_tx**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_no_tx) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_status) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_timefunc\_failures**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_timefunc_failures) |  |  |  | Yes | Global | No |
| [**rpl\_semi\_sync\_master\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**rpl\_semi\_sync\_master\_trace\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_trace_level) | Yes | Yes | Yes |  | Global | Yes |
| [**Rpl\_semi\_sync\_master\_tx\_avg\_wait\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_tx_avg_wait_time) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_tx\_wait\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_tx_wait_time) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_tx\_waits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_tx_waits) |  |  |  | Yes | Global | No |
| [**rpl\_semi\_sync\_master\_wait\_for\_slave\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_for_slave_count) | Yes | Yes | Yes |  | Global | Yes |
| [**rpl\_semi\_sync\_master\_wait\_no\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_no_slave) | Yes | Yes | Yes |  | Global | Yes |
| [**rpl\_semi\_sync\_master\_wait\_point**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_point) | Yes | Yes | Yes |  | Global | Yes |
| [**Rpl\_semi\_sync\_master\_wait\_pos\_backtraverse**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_wait_pos_backtraverse) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_wait\_sessions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_wait_sessions) |  |  |  | Yes | Global | No |
| [**Rpl\_semi\_sync\_master\_yes\_tx**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_yes_tx) |  |  |  | Yes | Global | No |
| [**rpl\_semi\_sync\_slave\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_slave_enabled) | Yes | Yes | Yes |  | Global | Yes |
| [**Rpl\_semi\_sync\_slave\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_slave_status) |  |  |  | Yes | Global | No |
| [**rpl\_semi\_sync\_slave\_trace\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_slave_trace_level) | Yes | Yes | Yes |  | Global | Yes |
| [**rpl\_stop\_slave\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_stop_slave_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**Rsa\_public\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rsa_public_key) |  |  |  | Yes | Global | No |
| [**safe-user-create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_safe-user-create) | Yes | Yes |  |  |  |  |
| [**schema\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_schema_definition_cache) | Yes | Yes | Yes |  | Global | Yes |
| [**secondary\_engine\_cost\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_secondary_engine_cost_threshold) |  |  | Yes |  | Session | Yes |
| [**Secondary\_engine\_execution\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Secondary_engine_execution_count) |  |  |  | Yes | Both | No |
| [**secure\_file\_priv**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_secure_file_priv) | Yes | Yes | Yes |  | Global | No |
| [**Select\_full\_join**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_full_join) |  |  |  | Yes | Both | No |
| [**Select\_full\_range\_join**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_full_range_join) |  |  |  | Yes | Both | No |
| [**select\_into\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_buffer_size) | Yes | Yes | Yes |  | Both | Yes |
| [**select\_into\_disk\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_disk_sync) | Yes | Yes | Yes |  | Both | Yes |
| [**select\_into\_disk\_sync\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_disk_sync_delay) | Yes | Yes | Yes |  | Both | Yes |
| [**Select\_range**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_range) |  |  |  | Yes | Both | No |
| [**Select\_range\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_range_check) |  |  |  | Yes | Both | No |
| [**Select\_scan**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_scan) |  |  |  | Yes | Both | No |
| [**server\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_server_id) | Yes | Yes | Yes |  | Global | Yes |
| [**server\_id\_bits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_server_id_bits) | Yes | Yes | Yes |  | Global | No |
| [**server\_uuid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_server_uuid) |  |  | Yes |  | Global | No |
| [**session\_track\_gtids**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_gtids) | Yes | Yes | Yes |  | Both | Yes |
| [**session\_track\_schema**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_schema) | Yes | Yes | Yes |  | Both | Yes |
| [**session\_track\_state\_change**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_state_change) | Yes | Yes | Yes |  | Both | Yes |
| [**session\_track\_system\_variables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_system_variables) | Yes | Yes | Yes |  | Both | Yes |
| [**session\_track\_transaction\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_transaction_info) | Yes | Yes | Yes |  | Both | Yes |
| [**sha256\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_auto_generate_rsa_keys) | Yes | Yes | Yes |  | Global | No |
| [**sha256\_password\_private\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_private_key_path) | Yes | Yes | Yes |  | Global | No |
| [**sha256\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_proxy_users) | Yes | Yes | Yes |  | Global | Yes |
| [**sha256\_password\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_public_key_path) | Yes | Yes | Yes |  | Global | No |
| [**shared\_memory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_shared_memory) | Yes | Yes | Yes |  | Global | No |
| [**shared\_memory\_base\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_shared_memory_base_name) | Yes | Yes | Yes |  | Global | No |
| [**show\_create\_table\_skip\_secondary\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_create_table_skip_secondary_engine) | Yes | Yes | Yes |  | Session | Yes |
| [**show\_create\_table\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_create_table_verbosity) | Yes | Yes | Yes |  | Both | Yes |
| [**show\_old\_temporals**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_old_temporals) | Yes | Yes | Yes |  | Both | Yes |
| [**show-slave-auth-info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_show-slave-auth-info) | Yes | Yes |  |  |  |  |
| [**skip-character-set-client-handshake**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_character-set-client-handshake) | Yes | Yes |  |  |  |  |
| [**skip\_external\_locking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_external_locking) | Yes | Yes | Yes |  | Global | No |
| [**skip-grant-tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-grant-tables) | Yes | Yes |  |  |  |  |
| [**skip-host-cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-host-cache) | Yes | Yes |  |  |  |  |
| [**skip\_name\_resolve**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_name_resolve) | Yes | Yes | Yes |  | Global | No |
| [**skip-ndbcluster**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_skip-ndbcluster) | Yes | Yes |  |  |  |  |
| [**skip\_networking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_networking) | Yes | Yes | Yes |  | Global | No |
| [**skip-new**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-new) | Yes | Yes |  |  |  |  |
| [**skip\_show\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-show-database) | Yes | Yes | Yes |  | Global | No |
| [**skip\_slave\_start**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_skip-slave-start) | Yes | Yes | Yes |  | Global | No |
| [**skip-ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) | Yes | Yes |  |  |  |  |
| [**skip-stack-trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-stack-trace) | Yes | Yes |  |  |  |  |
| [**slave\_allow\_batching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_slave_allow_batching) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_checkpoint\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_checkpoint_group) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_checkpoint\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_checkpoint_period) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_compressed\_protocol**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_compressed_protocol) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_exec\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_exec_mode) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_load\_tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_load_tmpdir) | Yes | Yes | Yes |  | Global | No |
| [**slave\_max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_max_allowed_packet) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_net\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_net_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**Slave\_open\_temp\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Slave_open_temp_tables) |  |  |  | Yes | Global | No |
| [**slave\_parallel\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_parallel_type) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_parallel\_workers**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_parallel_workers) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_pending\_jobs\_size\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_pending_jobs_size_max) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_preserve\_commit\_order**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_preserve_commit_order) | Yes | Yes | Yes |  | Global | Yes |
| [**Slave\_rows\_last\_search\_algorithm\_used**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Slave_rows_last_search_algorithm_used) |  |  |  | Yes | Global | No |
| [**slave\_rows\_search\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_rows_search_algorithms) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_skip\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_slave-skip-errors) | Yes | Yes | Yes |  | Global | No |
| [**slave-sql-verify-checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_slave-sql-verify-checksum) | Yes | Yes |  |  |  |  |
| [**slave\_sql\_verify\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_sql_verify_checksum) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_transaction\_retries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_transaction_retries) | Yes | Yes | Yes |  | Global | Yes |
| [**slave\_type\_conversions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_type_conversions) | Yes | Yes | Yes |  | Global | Yes |
| [**Slow\_launch\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Slow_launch_threads) |  |  |  | Yes | Both | No |
| [**slow\_launch\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_launch_time) | Yes | Yes | Yes |  | Global | Yes |
| [**Slow\_queries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Slow_queries) |  |  |  | Yes | Both | No |
| [**slow\_query\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log) | Yes | Yes | Yes |  | Global | Yes |
| [**slow\_query\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log_file) | Yes | Yes | Yes |  | Global | Yes |
| [**slow-start-timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_slow-start-timeout) | Yes | Yes |  |  |  |  |
| [**socket**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_socket) | Yes | Yes | Yes |  | Global | No |
| [**sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sort_buffer_size) | Yes | Yes | Yes |  | Both | Yes |
| [**Sort\_merge\_passes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Sort_merge_passes) |  |  |  | Yes | Both | No |
| [**Sort\_range**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Sort_range) |  |  |  | Yes | Both | No |
| [**Sort\_rows**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Sort_rows) |  |  |  | Yes | Both | No |
| [**Sort\_scan**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Sort_scan) |  |  |  | Yes | Both | No |
| [**sporadic-binlog-dump-fail**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_sporadic-binlog-dump-fail) | Yes | Yes |  |  |  |  |
| [**sql\_auto\_is\_null**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_auto_is_null) |  |  | Yes |  | Both | Yes |
| [**sql\_big\_selects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_big_selects) |  |  | Yes |  | Both | Yes |
| [**sql\_buffer\_result**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_buffer_result) |  |  | Yes |  | Both | Yes |
| [**sql\_log\_bin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sql_log_bin) |  |  | Yes |  | Session | Yes |
| [**sql\_log\_off**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_log_off) |  |  | Yes |  | Both | Yes |
| [**sql\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_sql-mode) | Yes | Yes | Yes |  | Both | Yes |
| [**sql\_notes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_notes) |  |  | Yes |  | Both | Yes |
| [**sql\_quote\_show\_create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_quote_show_create) |  |  | Yes |  | Both | Yes |
| [**sql\_require\_primary\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_require_primary_key) | Yes | Yes | Yes |  | Both | Yes |
| [**sql\_safe\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_safe_updates) |  |  | Yes |  | Both | Yes |
| [**sql\_select\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_select_limit) |  |  | Yes |  | Both | Yes |
| [**sql\_slave\_skip\_counter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sql_slave_skip_counter) |  |  | Yes |  | Global | Yes |
| [**sql\_warnings**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_warnings) |  |  | Yes |  | Both | Yes |
| [**ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) | Yes | Yes |  |  |  |  |
| [**Ssl\_accept\_renegotiates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_accept_renegotiates) |  |  |  | Yes | Global | No |
| [**Ssl\_accepts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_accepts) |  |  |  | Yes | Global | No |
| [**ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_ca) | Yes | Yes | Yes |  | Global | Varies |
| [**Ssl\_callback\_cache\_hits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_callback_cache_hits) |  |  |  | Yes | Global | No |
| [**ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_capath) | Yes | Yes | Yes |  | Global | Varies |
| [**ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_cert) | Yes | Yes | Yes |  | Global | Varies |
| [**Ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_cipher) |  |  |  | Yes | Both | No |
| [**ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_cipher) | Yes | Yes | Yes |  | Global | Varies |
| [**Ssl\_cipher\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_cipher_list) |  |  |  | Yes | Both | No |
| [**Ssl\_client\_connects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_client_connects) |  |  |  | Yes | Global | No |
| [**Ssl\_connect\_renegotiates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_connect_renegotiates) |  |  |  | Yes | Global | No |
| [**ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_crl) | Yes | Yes | Yes |  | Global | Varies |
| [**ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_crlpath) | Yes | Yes | Yes |  | Global | Varies |
| [**Ssl\_ctx\_verify\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_ctx_verify_depth) |  |  |  | Yes | Global | No |
| [**Ssl\_ctx\_verify\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_ctx_verify_mode) |  |  |  | Yes | Global | No |
| [**Ssl\_default\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_default_timeout) |  |  |  | Yes | Both | No |
| [**Ssl\_finished\_accepts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_finished_accepts) |  |  |  | Yes | Global | No |
| [**Ssl\_finished\_connects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_finished_connects) |  |  |  | Yes | Global | No |
| [**ssl\_fips\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_fips_mode) | Yes | Yes | Yes |  | Global | Yes |
| [**ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_key) | Yes | Yes | Yes |  | Global | Varies |
| [**Ssl\_server\_not\_after**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_server_not_after) |  |  |  | Yes | Both | No |
| [**Ssl\_server\_not\_before**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_server_not_before) |  |  |  | Yes | Both | No |
| [**Ssl\_session\_cache\_hits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_hits) |  |  |  | Yes | Global | No |
| [**Ssl\_session\_cache\_misses**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_misses) |  |  |  | Yes | Global | No |
| [**Ssl\_session\_cache\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_mode) |  |  |  | Yes | Global | No |
| [**Ssl\_session\_cache\_overflows**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_overflows) |  |  |  | Yes | Global | No |
| [**Ssl\_session\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_size) |  |  |  | Yes | Global | No |
| [**Ssl\_session\_cache\_timeouts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_timeouts) |  |  |  | Yes | Global | No |
| [**Ssl\_sessions\_reused**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_sessions_reused) |  |  |  | Yes | Both | No |
| [**Ssl\_used\_session\_cache\_entries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_used_session_cache_entries) |  |  |  | Yes | Global | No |
| [**Ssl\_verify\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_verify_depth) |  |  |  | Yes | Both | No |
| [**Ssl\_verify\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_verify_mode) |  |  |  | Yes | Both | No |
| [**Ssl\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_version) |  |  |  | Yes | Both | No |
| [**standalone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_standalone) | Yes | Yes |  |  |  |  |
| [**stored\_program\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_stored_program_cache) | Yes | Yes | Yes |  | Global | Yes |
| [**stored\_program\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_stored_program_definition_cache) | Yes | Yes | Yes |  | Global | Yes |
| [**super-large-pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_super-large-pages) | Yes | Yes |  |  |  |  |
| [**super\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_super_read_only) | Yes | Yes | Yes |  | Global | Yes |
| [**symbolic-links**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_symbolic-links) | Yes | Yes |  |  |  |  |
| [**sync\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_binlog) | Yes | Yes | Yes |  | Global | Yes |
| [**sync\_master\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_master_info) | Yes | Yes | Yes |  | Global | Yes |
| [**sync\_relay\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_relay_log) | Yes | Yes | Yes |  | Global | Yes |
| [**sync\_relay\_log\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_relay_log_info) | Yes | Yes | Yes |  | Global | Yes |
| [**sysdate-is-now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_sysdate-is-now) | Yes | Yes |  |  |  |  |
| [**syseventlog.facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.facility) | Yes | Yes | Yes |  | Global | Yes |
| [**syseventlog.include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.include_pid) | Yes | Yes | Yes |  | Global | Yes |
| [**syseventlog.tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.tag) | Yes | Yes | Yes |  | Global | Yes |
| [**system\_time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_system_time_zone) |  |  | Yes |  | Global | No |
| [**table\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_definition_cache) | Yes | Yes | Yes |  | Global | Yes |
| [**table\_encryption\_privilege\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_encryption_privilege_check) | Yes | Yes | Yes |  | Global | Yes |
| [**Table\_locks\_immediate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_locks_immediate) |  |  |  | Yes | Global | No |
| [**Table\_locks\_waited**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_locks_waited) |  |  |  | Yes | Global | No |
| [**table\_open\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_open_cache) | Yes | Yes | Yes |  | Global | Yes |
| [**Table\_open\_cache\_hits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_open_cache_hits) |  |  |  | Yes | Both | No |
| [**table\_open\_cache\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_open_cache_instances) | Yes | Yes | Yes |  | Global | No |
| [**Table\_open\_cache\_misses**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_open_cache_misses) |  |  |  | Yes | Both | No |
| [**Table\_open\_cache\_overflows**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_open_cache_overflows) |  |  |  | Yes | Both | No |
| [**tablespace\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tablespace_definition_cache) | Yes | Yes | Yes |  | Global | Yes |
| [**tc-heuristic-recover**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_tc-heuristic-recover) | Yes | Yes |  |  |  |  |
| [**Tc\_log\_max\_pages\_used**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Tc_log_max_pages_used) |  |  |  | Yes | Global | No |
| [**Tc\_log\_page\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Tc_log_page_size) |  |  |  | Yes | Global | No |
| [**Tc\_log\_page\_waits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Tc_log_page_waits) |  |  |  | Yes | Global | No |
| [**temptable\_max\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_max_mmap) | Yes | Yes | Yes |  | Global | Yes |
| [**temptable\_max\_ram**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_max_ram) | Yes | Yes | Yes |  | Global | Yes |
| [**temptable\_use\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_use_mmap) | Yes | Yes | Yes |  | Global | Yes |
| [**thread\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_cache_size) | Yes | Yes | Yes |  | Global | Yes |
| [**thread\_handling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_handling) | Yes | Yes | Yes |  | Global | No |
| [**thread\_pool\_algorithm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_algorithm) | Yes | Yes | Yes |  | Global | No |
| [**thread\_pool\_high\_priority\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_high_priority_connection) | Yes | Yes | Yes |  | Both | Yes |
| [**thread\_pool\_max\_active\_query\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_max_active_query_threads) | Yes | Yes | Yes |  | Global | Yes |
| [**thread\_pool\_max\_unused\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_max_unused_threads) | Yes | Yes | Yes |  | Global | Yes |
| [**thread\_pool\_prio\_kickup\_timer**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_prio_kickup_timer) | Yes | Yes | Yes |  | Global | Yes |
| [**thread\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_size) | Yes | Yes | Yes |  | Global | No |
| [**thread\_pool\_stall\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_stall_limit) | Yes | Yes | Yes |  | Global | Yes |
| [**thread\_stack**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_stack) | Yes | Yes | Yes |  | Global | No |
| [**Threads\_cached**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Threads_cached) |  |  |  | Yes | Global | No |
| [**Threads\_connected**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Threads_connected) |  |  |  | Yes | Global | No |
| [**Threads\_created**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Threads_created) |  |  |  | Yes | Global | No |
| [**Threads\_running**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Threads_running) |  |  |  | Yes | Global | No |
| [**time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_time_zone) |  |  | Yes |  | Both | Yes |
| [**timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_timestamp) |  |  | Yes |  | Session | Yes |
| [**tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tls_ciphersuites) | Yes | Yes | Yes |  | Global | Yes |
| [**tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tls_version) | Yes | Yes | Yes |  | Global | Varies |
| [**tmp\_table\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tmp_table_size) | Yes | Yes | Yes |  | Both | Yes |
| [**tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_tmpdir) | Yes | Yes | Yes |  | Global | No |
| [**transaction\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_alloc_block_size) | Yes | Yes | Yes |  | Both | Yes |
| [**transaction\_allow\_batching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_transaction_allow_batching) |  |  | Yes |  | Session | Yes |
| [**transaction\_isolation**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_transaction-isolation) | Yes | Yes | Yes |  | Both | Yes |
| [**transaction\_prealloc\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_prealloc_size) | Yes | Yes | Yes |  | Both | Yes |
| [**transaction\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_transaction-read-only) | Yes | Yes | Yes |  | Both | Yes |
| [**transaction\_write\_set\_extraction**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_transaction_write_set_extraction) | Yes | Yes | Yes |  | Both | Yes |
| [**unique\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_unique_checks) |  |  | Yes |  | Both | Yes |
| [**updatable\_views\_with\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_updatable_views_with_limit) | Yes | Yes | Yes |  | Both | Yes |
| [**upgrade**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_upgrade) | Yes | Yes |  |  |  |  |
| [**Uptime**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Uptime) |  |  |  | Yes | Global | No |
| [**Uptime\_since\_flush\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Uptime_since_flush_status) |  |  |  | Yes | Global | No |
| [**use\_secondary\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_use_secondary_engine) |  |  | Yes |  | Session | Yes |
| [**user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_user) | Yes | Yes |  |  |  |  |
| [**validate-config**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_validate-config) | Yes | Yes |  |  |  |  |
| [**validate-password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#option_mysqld_validate-password) | Yes | Yes |  |  |  |  |
| [**validate\_password\_check\_user\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_check_user_name) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password\_dictionary\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_dictionary_file) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password\_dictionary\_file\_last\_parsed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_validate_password_dictionary_file_last_parsed) |  |  |  | Yes | Global | No |
| [**validate\_password\_dictionary\_file\_words\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_validate_password_dictionary_file_words_count) |  |  |  | Yes | Global | No |
| [**validate\_password\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_length) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password\_mixed\_case\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_mixed_case_count) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password\_number\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_number_count) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_policy) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password\_special\_char\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_special_char_count) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password.check\_user\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.check_user_name) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password.dictionary\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.dictionary_file) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password.dictionary\_file\_last\_parsed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_validate_password.dictionary_file_last_parsed) |  |  |  | Yes | Global | No |
| [**validate\_password.dictionary\_file\_words\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_validate_password.dictionary_file_words_count) |  |  |  | Yes | Global | No |
| [**validate\_password.length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.length) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password.mixed\_case\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.mixed_case_count) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password.number\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.number_count) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password.policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.policy) | Yes | Yes | Yes |  | Global | Yes |
| [**validate\_password.special\_char\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.special_char_count) | Yes | Yes | Yes |  | Global | Yes |
| [**validate-user-plugins**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_validate-user-plugins) | Yes | Yes |  |  |  |  |
| [**verbose**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_verbose) | Yes | Yes |  |  |  |  |
| [**version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version) |  |  | Yes |  | Global | No |
| [**version\_comment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_comment) |  |  | Yes |  | Global | No |
| [**version\_compile\_machine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_machine) |  |  | Yes |  | Global | No |
| [**version\_compile\_os**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_os) |  |  | Yes |  | Global | No |
| [**version\_compile\_zlib**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_zlib) |  |  | Yes |  | Global | No |
| [**version\_tokens\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_tokens_session) | Yes | Yes | Yes |  | Both | Yes |
| [**version\_tokens\_session\_number**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_tokens_session_number) | Yes | Yes | Yes |  | Both | No |
| [**wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_wait_timeout) | Yes | Yes | Yes |  | Both | Yes |
| [**warning\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_warning_count) |  |  | Yes |  | Session | No |
| [**windowing\_use\_high\_precision**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_windowing_use_high_precision) | Yes | Yes | Yes |  | Both | Yes |

***注意事项。***

***1. 这个选项是动态的，但只应由服务器设置。你不应该手动设置这个变量。***

### 5.1.5 服务端系统变量参考

下表列出了在mysqld中适用的所有系统变量。

该表在一个统一的列表中列出了命令行选项（Cmd-line）、在配置文件中有效的选项（Option file）、服务器系统变量（System Var）和状态变量（Status var），并指出了每个选项或变量的有效位置。如果在命令行或选项文件中设置的服务器选项与相应的系统变量名称不同，变量名称会紧接着在相应的选项下面注明。变量的范围（Var Scope）是全局、会话或两者。关于设置和使用这些变量的细节，请参见相应的项目描述。在适当的地方，还提供了有关这些项目的进一步信息的直接链接。

**Table 5.2 System Variable Summary**

| **Name** | **Cmd-Line** | **Option File** | **System Var** | **Var Scope** | **Dynamic** |
| --- | --- | --- | --- | --- | --- |
| [**activate\_all\_roles\_on\_login**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_activate_all_roles_on_login) | Yes | Yes | Yes | Global | Yes |
| [**admin\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_address) | Yes | Yes | Yes | Global | No |
| [**admin\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_port) | Yes | Yes | Yes | Global | No |
| [**admin\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_ca) | Yes | Yes | Yes | Global | Yes |
| [**admin\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_capath) | Yes | Yes | Yes | Global | Yes |
| [**admin\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_cert) | Yes | Yes | Yes | Global | Yes |
| [**admin\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_cipher) | Yes | Yes | Yes | Global | Yes |
| [**admin\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_crl) | Yes | Yes | Yes | Global | Yes |
| [**admin\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_crlpath) | Yes | Yes | Yes | Global | Yes |
| [**admin\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_key) | Yes | Yes | Yes | Global | Yes |
| [**admin\_tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_tls_ciphersuites) | Yes | Yes | Yes | Global | Yes |
| [**admin\_tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_tls_version) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_buffer_size) | Yes | Yes | Yes | Global | No |
| [**audit\_log\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_compression) | Yes | Yes | Yes | Global | No |
| [**audit\_log\_connection\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_connection_policy) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_current\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_current_session) |  |  | Yes | Both | No |
| [**audit\_log\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_encryption) | Yes | Yes | Yes | Global | No |
| [**audit\_log\_exclude\_accounts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_exclude_accounts) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_file) | Yes | Yes | Yes | Global | No |
| [**audit\_log\_filter\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_filter_id) |  |  | Yes | Both | No |
| [**audit\_log\_flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_flush) |  |  | Yes | Global | Yes |
| [**audit\_log\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_format) | Yes | Yes | Yes | Global | No |
| [**audit\_log\_include\_accounts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_include_accounts) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_max_size) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_password\_history\_keep\_days**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_password_history_keep_days) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_policy) | Yes | Yes | Yes | Global | No |
| [**audit\_log\_prune\_seconds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_prune_seconds) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_read\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_read_buffer_size) | Yes | Yes | Yes | Varies | Varies |
| [**audit\_log\_rotate\_on\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_rotate_on_size) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_statement\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_statement_policy) | Yes | Yes | Yes | Global | Yes |
| [**audit\_log\_strategy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_strategy) | Yes | Yes | Yes | Global | No |
| [**authentication\_ldap\_sasl\_auth\_method\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_auth_method_name) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_bind\_base\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_base_dn) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_bind\_root\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_root_dn) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_bind\_root\_pwd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_root_pwd) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_ca_path) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_group\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_group_search_attr) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_group\_search\_filter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_group_search_filter) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_init\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_init_pool_size) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_log\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_log_status) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_max\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_max_pool_size) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_referral**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_referral) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_server\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_server_host) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_server\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_server_port) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_tls**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_tls) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_sasl\_user\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_user_search_attr) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_auth\_method\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_auth_method_name) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_bind\_base\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_base_dn) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_bind\_root\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_root_dn) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_bind\_root\_pwd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_root_pwd) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_ca_path) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_group\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_group_search_attr) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_group\_search\_filter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_group_search_filter) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_init\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_init_pool_size) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_log\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_log_status) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_max\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_max_pool_size) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_referral**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_referral) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_server\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_server_host) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_server\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_server_port) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_tls**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_tls) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_ldap\_simple\_user\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_user_search_attr) | Yes | Yes | Yes | Global | Yes |
| [**authentication\_windows\_log\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_authentication_windows_log_level) | Yes | Yes | Yes | Global | No |
| [**authentication\_windows\_use\_principal\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_authentication_windows_use_principal_name) | Yes | Yes | Yes | Global | No |
| [**auto\_generate\_certs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_auto_generate_certs) | Yes | Yes | Yes | Global | No |
| [**auto\_increment\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_auto_increment_increment) | Yes | Yes | Yes | Both | Yes |
| [**auto\_increment\_offset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_auto_increment_offset) | Yes | Yes | Yes | Both | Yes |
| [**autocommit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_autocommit) | Yes | Yes | Yes | Both | Yes |
| [**automatic\_sp\_privileges**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_automatic_sp_privileges) | Yes | Yes | Yes | Global | Yes |
| [**avoid\_temporal\_upgrade**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_avoid_temporal_upgrade) | Yes | Yes | Yes | Global | Yes |
| [**back\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_back_log) | Yes | Yes | Yes | Global | No |
| [**basedir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_basedir) | Yes | Yes | Yes | Global | No |
| [**big\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_big_tables) | Yes | Yes | Yes | Both | Yes |
| [**bind\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bind_address) | Yes | Yes | Yes | Global | No |
| [**binlog\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_cache_size) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_checksum) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_direct\_non\_transactional\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_direct_non_transactional_updates) | Yes | Yes | Yes | Both | Yes |
| [**binlog\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_encryption) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_error\_action**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_error_action) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_expire\_logs\_seconds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_expire_logs_seconds) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_format) | Yes | Yes | Yes | Both | Yes |
| [**binlog\_group\_commit\_sync\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_group_commit_sync_delay) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_group\_commit\_sync\_no\_delay\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_group_commit_sync_no_delay_count) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_gtid\_simple\_recovery**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_gtid_simple_recovery) | Yes | Yes | Yes | Global | No |
| [**binlog\_max\_flush\_queue\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_max_flush_queue_time) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_order\_commits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_order_commits) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_rotate\_encryption\_master\_key\_at\_startup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_rotate_encryption_master_key_at_startup) | Yes | Yes | Yes | Global | No |
| [**binlog\_row\_event\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_binlog-row-event-max-size) | Yes | Yes | Yes | Global | No |
| [**binlog\_row\_image**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_image) | Yes | Yes | Yes | Both | Yes |
| [**binlog\_row\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_metadata) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_row\_value\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_value_options) | Yes | Yes | Yes | Both | Yes |
| [**binlog\_rows\_query\_log\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_rows_query_log_events) | Yes | Yes | Yes | Both | Yes |
| [**binlog\_stmt\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_stmt_cache_size) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_transaction\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_compression) | Yes | Yes | Yes | Both | Yes |
| [**binlog\_transaction\_compression\_level\_zstd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_compression_level_zstd) | Yes | Yes | Yes | Both | Yes |
| [**binlog\_transaction\_dependency\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_dependency_history_size) | Yes | Yes | Yes | Global | Yes |
| [**binlog\_transaction\_dependency\_tracking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_dependency_tracking) | Yes | Yes | Yes | Global | Yes |
| [**block\_encryption\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_block_encryption_mode) | Yes | Yes | Yes | Both | Yes |
| [**bulk\_insert\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bulk_insert_buffer_size) | Yes | Yes | Yes | Both | Yes |
| [**caching\_sha2\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_auto_generate_rsa_keys) | Yes | Yes | Yes | Global | No |
| [**caching\_sha2\_password\_digest\_rounds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_digest_rounds) | Yes | Yes | Yes | Global | No |
| [**caching\_sha2\_password\_private\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_private_key_path) | Yes | Yes | Yes | Global | No |
| [**caching\_sha2\_password\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_public_key_path) | Yes | Yes | Yes | Global | No |
| [**character\_set\_client**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_client) |  |  | Yes | Both | Yes |
| [**character\_set\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_connection) |  |  | Yes | Both | Yes |
| [**character\_set\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_database)**(note 1)** |  |  | Yes | Both | Yes |
| [**character\_set\_filesystem**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_filesystem) | Yes | Yes | Yes | Both | Yes |
| [**character\_set\_results**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_results) |  |  | Yes | Both | Yes |
| [**character\_set\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_server) | Yes | Yes | Yes | Both | Yes |
| [**character\_set\_system**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_system) |  |  | Yes | Global | No |
| [**character\_sets\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_sets_dir) | Yes | Yes | Yes | Global | No |
| [**check\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_check_proxy_users) | Yes | Yes | Yes | Global | Yes |
| [**clone\_autotune\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_autotune_concurrency) | Yes | Yes | Yes | Global | Yes |
| [**clone\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_buffer_size) | Yes | Yes | Yes | Global | Yes |
| [**clone\_ddl\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ddl_timeout) | Yes | Yes | Yes | Global | Yes |
| [**clone\_donor\_timeout\_after\_network\_failure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_donor_timeout_after_network_failure) | Yes | Yes | Yes | Global | Yes |
| [**clone\_enable\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_enable_compression) | Yes | Yes | Yes | Global | Yes |
| [**clone\_max\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_concurrency) | Yes | Yes | Yes | Global | Yes |
| [**clone\_max\_data\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_data_bandwidth) | Yes | Yes | Yes | Global | Yes |
| [**clone\_max\_network\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_network_bandwidth) | Yes | Yes | Yes | Global | Yes |
| [**clone\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_ca) | Yes | Yes | Yes | Global | Yes |
| [**clone\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_cert) | Yes | Yes | Yes | Global | Yes |
| [**clone\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_key) | Yes | Yes | Yes | Global | Yes |
| [**clone\_valid\_donor\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_valid_donor_list) | Yes | Yes | Yes | Global | Yes |
| [**collation\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_connection) |  |  | Yes | Both | Yes |
| [**collation\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_database)**(note 1)** |  |  | Yes | Both | Yes |
| [**collation\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_server) | Yes | Yes | Yes | Both | Yes |
| [**completion\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_completion_type) | Yes | Yes | Yes | Both | Yes |
| [**concurrent\_insert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_concurrent_insert) | Yes | Yes | Yes | Global | Yes |
| [**connect\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_connect_timeout) | Yes | Yes | Yes | Global | Yes |
| [**connection\_control\_failed\_connections\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_failed_connections_threshold) | Yes | Yes | Yes | Global | Yes |
| [**connection\_control\_max\_connection\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_max_connection_delay) | Yes | Yes | Yes | Global | Yes |
| [**connection\_control\_min\_connection\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_min_connection_delay) | Yes | Yes | Yes | Global | Yes |
| [**core\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_core_file) |  |  | Yes | Global | No |
| [**create\_admin\_listener\_thread**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_create_admin_listener_thread) | Yes | Yes | Yes | Global | No |
| [**cte\_max\_recursion\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_cte_max_recursion_depth) | Yes | Yes | Yes | Both | Yes |
| [**daemon\_memcached\_enable\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_enable_binlog) | Yes | Yes | Yes | Global | No |
| [**daemon\_memcached\_engine\_lib\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_engine_lib_name) | Yes | Yes | Yes | Global | No |
| [**daemon\_memcached\_engine\_lib\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_engine_lib_path) | Yes | Yes | Yes | Global | No |
| [**daemon\_memcached\_option**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_option) | Yes | Yes | Yes | Global | No |
| [**daemon\_memcached\_r\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_r_batch_size) | Yes | Yes | Yes | Global | No |
| [**daemon\_memcached\_w\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_daemon_memcached_w_batch_size) | Yes | Yes | Yes | Global | No |
| [**datadir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_datadir) | Yes | Yes | Yes | Global | No |
| [**debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_debug) | Yes | Yes | Yes | Both | Yes |
| [**debug\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug_sync) |  |  | Yes | Session | Yes |
| [**default\_authentication\_plugin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_authentication_plugin) | Yes | Yes | Yes | Global | No |
| [**default\_collation\_for\_utf8mb4**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_collation_for_utf8mb4) |  |  | Yes | Both | Yes |
| [**default\_password\_lifetime**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_password_lifetime) | Yes | Yes | Yes | Global | Yes |
| [**default\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_storage_engine) | Yes | Yes | Yes | Both | Yes |
| [**default\_table\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_table_encryption) | Yes | Yes | Yes | Both | Yes |
| [**default\_tmp\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_tmp_storage_engine) | Yes | Yes | Yes | Both | Yes |
| [**default\_week\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_week_format) | Yes | Yes | Yes | Both | Yes |
| [**delay\_key\_write**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delay_key_write) | Yes | Yes | Yes | Global | Yes |
| [**delayed\_insert\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_insert_limit) | Yes | Yes | Yes | Global | Yes |
| [**delayed\_insert\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_insert_timeout) | Yes | Yes | Yes | Global | Yes |
| [**delayed\_queue\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_queue_size) | Yes | Yes | Yes | Global | Yes |
| [**disabled\_storage\_engines**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_disabled_storage_engines) | Yes | Yes | Yes | Global | No |
| [**disconnect\_on\_expired\_password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_disconnect_on_expired_password) | Yes | Yes | Yes | Global | No |
| [**div\_precision\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_div_precision_increment) | Yes | Yes | Yes | Both | Yes |
| [**dragnet.log\_error\_filter\_rules**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_dragnet.log_error_filter_rules) | Yes | Yes | Yes | Global | Yes |
| [**end\_markers\_in\_json**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_end_markers_in_json) | Yes | Yes | Yes | Both | Yes |
| [**enforce\_gtid\_consistency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_enforce_gtid_consistency) | Yes | Yes | Yes | Global | Yes |
| [**eq\_range\_index\_dive\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_eq_range_index_dive_limit) | Yes | Yes | Yes | Both | Yes |
| [**error\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_error_count) |  |  | Yes | Session | No |
| [**event\_scheduler**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_event_scheduler) | Yes | Yes | Yes | Global | Yes |
| [**expire\_logs\_days**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_expire_logs_days) | Yes | Yes | Yes | Global | Yes |
| [**explicit\_defaults\_for\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_explicit_defaults_for_timestamp) | Yes | Yes | Yes | Both | Yes |
| [**external\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_external_user) |  |  | Yes | Session | No |
| [**flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush) | Yes | Yes | Yes | Global | Yes |
| [**flush\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush_time) | Yes | Yes | Yes | Global | Yes |
| [**foreign\_key\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_foreign_key_checks) |  |  | Yes | Both | Yes |
| [**ft\_boolean\_syntax**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_boolean_syntax) | Yes | Yes | Yes | Global | Yes |
| [**ft\_max\_word\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_max_word_len) | Yes | Yes | Yes | Global | No |
| [**ft\_min\_word\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_min_word_len) | Yes | Yes | Yes | Global | No |
| [**ft\_query\_expansion\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_query_expansion_limit) | Yes | Yes | Yes | Global | No |
| [**ft\_stopword\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_stopword_file) | Yes | Yes | Yes | Global | No |
| [**general\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log) | Yes | Yes | Yes | Global | Yes |
| [**general\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log_file) | Yes | Yes | Yes | Global | Yes |
| [**generated\_random\_password\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_generated_random_password_length) | Yes | Yes | Yes | Both | Yes |
| [**group\_concat\_max\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_group_concat_max_len) | Yes | Yes | Yes | Both | Yes |
| [**group\_replication\_advertise\_recovery\_endpoints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_advertise_recovery_endpoints) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_allow\_local\_lower\_version\_join**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_allow_local_lower_version_join) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_auto\_increment\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_auto_increment_increment) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_autorejoin\_tries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_autorejoin_tries) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_bootstrap\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_bootstrap_group) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_clone\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_clone_threshold) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_communication\_debug\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_communication_debug_options) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_communication\_max\_message\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_communication_max_message_size) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_components\_stop\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_components_stop_timeout) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_compression\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_compression_threshold) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_consistency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_consistency) | Yes | Yes | Yes | Both | Yes |
| [**group\_replication\_enforce\_update\_everywhere\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_enforce_update_everywhere_checks) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_exit\_state\_action**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_exit_state_action) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_applier\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_applier_threshold) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_certifier\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_certifier_threshold) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_hold\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_hold_percent) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_max\_commit\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_max_commit_quota) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_member\_quota\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_member_quota_percent) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_min\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_min_quota) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_min\_recovery\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_min_recovery_quota) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_mode) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_period) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_flow\_control\_release\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_release_percent) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_force\_members**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_force_members) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_group\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_group_name) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_group\_seeds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_group_seeds) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_gtid\_assignment\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_gtid_assignment_block_size) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_ip\_allowlist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ip_allowlist) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_ip\_whitelist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ip_whitelist) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_local\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_local_address) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_member\_expel\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_member_expel_timeout) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_member\_weight**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_member_weight) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_message\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_message_cache_size) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_poll\_spin\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_poll_spin_loops) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_complete\_at**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_complete_at) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_compression_algorithms) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_get\_public\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_get_public_key) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_public_key_path) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_reconnect\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_reconnect_interval) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_retry\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_retry_count) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_ca) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_capath) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_cert) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_cipher) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_crl) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_crlpath) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_key) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_ssl\_verify\_server\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_verify_server_cert) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_tls_ciphersuites) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_tls_version) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_use\_ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_use_ssl) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_recovery\_zstd\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_zstd_compression_level) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_single\_primary\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_single_primary_mode) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_ssl\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ssl_mode) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_start\_on\_boot**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_start_on_boot) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_tls\_source**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_tls_source) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_transaction\_size\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_transaction_size_limit) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_unreachable\_majority\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_unreachable_majority_timeout) | Yes | Yes | Yes | Global | Yes |
| [**group\_replication\_view\_change\_uuid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_view_change_uuid) | Yes | Yes | Yes | Global | Yes |
| [**gtid\_executed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_executed) |  |  | Yes | Global | No |
| [**gtid\_executed\_compression\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_executed_compression_period) | Yes | Yes | Yes | Global | Yes |
| [**gtid\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_mode) | Yes | Yes | Yes | Global | Yes |
| [**gtid\_next**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_next) |  |  | Yes | Session | Yes |
| [**gtid\_owned**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_owned) |  |  | Yes | Both | No |
| [**gtid\_purged**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_purged) |  |  | Yes | Global | Yes |
| [**have\_compress**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_compress) |  |  | Yes | Global | No |
| [**have\_dynamic\_loading**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_dynamic_loading) |  |  | Yes | Global | No |
| [**have\_geometry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_geometry) |  |  | Yes | Global | No |
| [**have\_openssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_openssl) |  |  | Yes | Global | No |
| [**have\_profiling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_profiling) |  |  | Yes | Global | No |
| [**have\_query\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_query_cache) |  |  | Yes | Global | No |
| [**have\_rtree\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_rtree_keys) |  |  | Yes | Global | No |
| [**have\_ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_ssl) |  |  | Yes | Global | No |
| [**have\_statement\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_statement_timeout) |  |  | Yes | Global | No |
| [**have\_symlink**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_symlink) |  |  | Yes | Global | No |
| [**histogram\_generation\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_histogram_generation_max_mem_size) | Yes | Yes | Yes | Both | Yes |
| [**host\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_host_cache_size) | Yes | Yes | Yes | Global | Yes |
| [**hostname**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_hostname) |  |  | Yes | Global | No |
| [**identity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_identity) |  |  | Yes | Session | Yes |
| [**immediate\_server\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_immediate_server_version) |  |  | Yes | Session | Yes |
| [**information\_schema\_stats\_expiry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_information_schema_stats_expiry) | Yes | Yes | Yes | Both | Yes |
| [**init\_connect**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_init_connect) | Yes | Yes | Yes | Global | Yes |
| [**init\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_init_file) | Yes | Yes | Yes | Global | No |
| [**init\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_init_slave) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_adaptive\_flushing**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_flushing) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_adaptive\_flushing\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_flushing_lwm) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_adaptive\_hash\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_hash_index) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_adaptive\_hash\_index\_parts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_hash_index_parts) | Yes | Yes | Yes | Global | No |
| [**innodb\_adaptive\_max\_sleep\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_max_sleep_delay) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_api\_bk\_commit\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_bk_commit_interval) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_api\_disable\_rowlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_disable_rowlock) | Yes | Yes | Yes | Global | No |
| [**innodb\_api\_enable\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_enable_binlog) | Yes | Yes | Yes | Global | No |
| [**innodb\_api\_enable\_mdl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_enable_mdl) | Yes | Yes | Yes | Global | No |
| [**innodb\_api\_trx\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_trx_level) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_autoextend\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_autoextend_increment) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_autoinc\_lock\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_autoinc_lock_mode) | Yes | Yes | Yes | Global | No |
| [**innodb\_background\_drop\_list\_empty**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_background_drop_list_empty) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_buffer\_pool\_chunk\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_chunk_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_buffer\_pool\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_debug) | Yes | Yes | Yes | Global | No |
| [**innodb\_buffer\_pool\_dump\_at\_shutdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_at_shutdown) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_buffer\_pool\_dump\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_now) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_buffer\_pool\_dump\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_pct) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_buffer\_pool\_filename**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_filename) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_buffer\_pool\_in\_core\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_in_core_file) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_buffer\_pool\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_instances) | Yes | Yes | Yes | Global | No |
| [**innodb\_buffer\_pool\_load\_abort**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_abort) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_buffer\_pool\_load\_at\_startup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_at_startup) | Yes | Yes | Yes | Global | No |
| [**innodb\_buffer\_pool\_load\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_now) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_buffer\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_size) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_change\_buffer\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffer_max_size) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_change\_buffering**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffering) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_change\_buffering\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffering_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_checkpoint\_disabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_checkpoint_disabled) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_checksum\_algorithm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_checksum_algorithm) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_cmp\_per\_index\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_cmp_per_index_enabled) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_commit\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_commit_concurrency) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_compress\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compress_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_compression\_failure\_threshold\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_failure_threshold_pct) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_level) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_compression\_pad\_pct\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_pad_pct_max) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_concurrency\_tickets**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_concurrency_tickets) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_data\_file\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_data_file_path) | Yes | Yes | Yes | Global | No |
| [**innodb\_data\_home\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_data_home_dir) | Yes | Yes | Yes | Global | No |
| [**innodb\_ddl\_log\_crash\_reset\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ddl_log_crash_reset_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_deadlock\_detect**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_deadlock_detect) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_dedicated\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_dedicated_server) | Yes | Yes | Yes | Global | No |
| [**innodb\_default\_row\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_default_row_format) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_directories**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_directories) | Yes | Yes | Yes | Global | No |
| [**innodb\_disable\_sort\_file\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_disable_sort_file_cache) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_doublewrite**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite) | Yes | Yes | Yes | Global | No |
| [**innodb\_doublewrite\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite_batch_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_doublewrite\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite_dir) | Yes | Yes | Yes | Global | No |
| [**innodb\_doublewrite\_files**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite_files) | Yes | Yes | Yes | Global | No |
| [**innodb\_doublewrite\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_doublewrite_pages) | Yes | Yes | Yes | Global | No |
| [**innodb\_extend\_and\_initialize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_extend_and_initialize) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_fast\_shutdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fast_shutdown) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_fil\_make\_page\_dirty\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fil_make_page_dirty_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_file\_per\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_file_per_table) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_fill\_factor**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fill_factor) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_flush\_log\_at\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_log_at_timeout) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_flush\_log\_at\_trx\_commit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_log_at_trx_commit) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_flush\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_method) | Yes | Yes | Yes | Global | No |
| [**innodb\_flush\_neighbors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_neighbors) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_flush\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_sync) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_flushing\_avg\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flushing_avg_loops) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_force\_load\_corrupted**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_force_load_corrupted) | Yes | Yes | Yes | Global | No |
| [**innodb\_force\_recovery**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_force_recovery) | Yes | Yes | Yes | Global | No |
| [**innodb\_fsync\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fsync_threshold) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_ft\_aux\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_aux_table) |  |  | Yes | Global | Yes |
| [**innodb\_ft\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_cache_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_ft\_enable\_diag\_print**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_enable_diag_print) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_ft\_enable\_stopword**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_enable_stopword) | Yes | Yes | Yes | Both | Yes |
| [**innodb\_ft\_max\_token\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_max_token_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_ft\_min\_token\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_min_token_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_ft\_num\_word\_optimize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_num_word_optimize) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_ft\_result\_cache\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_result_cache_limit) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_ft\_server\_stopword\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_server_stopword_table) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_ft\_sort\_pll\_degree**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_sort_pll_degree) | Yes | Yes | Yes | Global | No |
| [**innodb\_ft\_total\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_total_cache_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_ft\_user\_stopword\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_user_stopword_table) | Yes | Yes | Yes | Both | Yes |
| [**innodb\_idle\_flush\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_idle_flush_pct) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_io\_capacity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_io_capacity) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_io\_capacity\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_io_capacity_max) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_limit\_optimistic\_insert\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_limit_optimistic_insert_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_lock_wait_timeout) | Yes | Yes | Yes | Both | Yes |
| [**innodb\_log\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_buffer_size) | Yes | Yes | Yes | Global | Varies |
| [**innodb\_log\_checkpoint\_fuzzy\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checkpoint_fuzzy_now) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_log\_checkpoint\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checkpoint_now) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_log\_checksums**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checksums) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_log\_compressed\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_compressed_pages) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_log\_file\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_file_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_log\_files\_in\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_files_in_group) | Yes | Yes | Yes | Global | No |
| [**innodb\_log\_group\_home\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_group_home_dir) | Yes | Yes | Yes | Global | No |
| [**innodb\_log\_spin\_cpu\_abs\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_spin_cpu_abs_lwm) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_log\_spin\_cpu\_pct\_hwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_spin_cpu_pct_hwm) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_log\_wait\_for\_flush\_spin\_hwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_wait_for_flush_spin_hwm) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_log\_write\_ahead\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_write_ahead_size) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_log\_writer\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_writer_threads) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_lru\_scan\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_lru_scan_depth) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_max\_dirty\_pages\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_dirty_pages_pct) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_max\_dirty\_pages\_pct\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_dirty_pages_pct_lwm) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_max\_purge\_lag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_purge_lag) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_max\_purge\_lag\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_purge_lag_delay) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_max\_undo\_log\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_undo_log_size) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_merge\_threshold\_set\_all\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_merge_threshold_set_all_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_monitor\_disable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_disable) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_monitor\_enable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_enable) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_monitor\_reset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_reset) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_monitor\_reset\_all**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_reset_all) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_numa\_interleave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_numa_interleave) | Yes | Yes | Yes | Global | No |
| [**innodb\_old\_blocks\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_old_blocks_pct) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_old\_blocks\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_old_blocks_time) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_online\_alter\_log\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_online_alter_log_max_size) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_open\_files**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_open_files) | Yes | Yes | Yes | Global | No |
| [**innodb\_optimize\_fulltext\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_optimize_fulltext_only) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_page\_cleaners**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_page_cleaners) | Yes | Yes | Yes | Global | No |
| [**innodb\_page\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_page_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_parallel\_read\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_parallel_read_threads) | Yes | Yes | Yes | Session | Yes |
| [**innodb\_print\_all\_deadlocks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_print_all_deadlocks) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_print\_ddl\_logs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_print_ddl_logs) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_purge\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_purge_batch_size) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_purge\_rseg\_truncate\_frequency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_purge_rseg_truncate_frequency) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_purge\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_purge_threads) | Yes | Yes | Yes | Global | No |
| [**innodb\_random\_read\_ahead**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_random_read_ahead) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_read\_ahead\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_read_ahead_threshold) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_read\_io\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_read_io_threads) | Yes | Yes | Yes | Global | No |
| [**innodb\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_read_only) | Yes | Yes | Yes | Global | No |
| [**innodb\_redo\_log\_archive\_dirs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_redo_log_archive_dirs) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_redo\_log\_encrypt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_redo_log_encrypt) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_replication\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_replication_delay) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_rollback\_on\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_rollback_on_timeout) | Yes | Yes | Yes | Global | No |
| [**innodb\_rollback\_segments**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_rollback_segments) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_saved\_page\_number\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_saved_page_number_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_segment\_reserve\_factor**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_segment_reserve_factor) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sort_buffer_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_spin\_wait\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_spin_wait_delay) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_spin\_wait\_pause\_multiplier**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_spin_wait_pause_multiplier) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_stats\_auto\_recalc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_auto_recalc) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_stats\_include\_delete\_marked**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_include_delete_marked) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_stats\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_method) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_stats\_on\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_on_metadata) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_stats\_persistent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_persistent) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_stats\_persistent\_sample\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_persistent_sample_pages) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_stats\_transient\_sample\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_transient_sample_pages) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_status\_output**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_status_output) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_status\_output\_locks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_status_output_locks) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_strict\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_strict_mode) | Yes | Yes | Yes | Both | Yes |
| [**innodb\_sync\_array\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sync_array_size) | Yes | Yes | Yes | Global | No |
| [**innodb\_sync\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sync_debug) | Yes | Yes | Yes | Global | No |
| [**innodb\_sync\_spin\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sync_spin_loops) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_table\_locks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_table_locks) | Yes | Yes | Yes | Both | Yes |
| [**innodb\_temp\_data\_file\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_temp_data_file_path) | Yes | Yes | Yes | Global | No |
| [**innodb\_temp\_tablespaces\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_temp_tablespaces_dir) | Yes | Yes | Yes | Global | No |
| [**innodb\_thread\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_thread_concurrency) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_thread\_sleep\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_thread_sleep_delay) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_tmpdir) | Yes | Yes | Yes | Both | Yes |
| [**innodb\_trx\_purge\_view\_update\_only\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_trx_purge_view_update_only_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_trx\_rseg\_n\_slots\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_trx_rseg_n_slots_debug) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_undo\_directory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_directory) | Yes | Yes | Yes | Global | No |
| [**innodb\_undo\_log\_encrypt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_log_encrypt) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_undo\_log\_truncate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_log_truncate) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_undo\_tablespaces**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_tablespaces) | Yes | Yes | Yes | Global | Varies |
| [**innodb\_use\_fdatasync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_use_fdatasync) | Yes | Yes | Yes | Global | Yes |
| [**innodb\_use\_native\_aio**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_use_native_aio) | Yes | Yes | Yes | Global | No |
| [**innodb\_validate\_tablespace\_paths**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_validate_tablespace_paths) | Yes | Yes | Yes | Global | No |
| [**innodb\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_version) |  |  | Yes | Global | No |
| [**innodb\_write\_io\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_write_io_threads) | Yes | Yes | Yes | Global | No |
| [**insert\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_insert_id) |  |  | Yes | Session | Yes |
| [**interactive\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_interactive_timeout) | Yes | Yes | Yes | Both | Yes |
| [**internal\_tmp\_disk\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_internal_tmp_disk_storage_engine) | Yes | Yes | Yes | Global | Yes |
| [**internal\_tmp\_mem\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_internal_tmp_mem_storage_engine) | Yes | Yes | Yes | Both | Yes |
| [**join\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_join_buffer_size) | Yes | Yes | Yes | Both | Yes |
| [**keep\_files\_on\_create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_keep_files_on_create) | Yes | Yes | Yes | Both | Yes |
| [**key\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_buffer_size) | Yes | Yes | Yes | Global | Yes |
| [**key\_cache\_age\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_age_threshold) | Yes | Yes | Yes | Global | Yes |
| [**key\_cache\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_block_size) | Yes | Yes | Yes | Global | Yes |
| [**key\_cache\_division\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_division_limit) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_aws\_cmk\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_cmk_id) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_aws\_conf\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_conf_file) | Yes | Yes | Yes | Global | No |
| [**keyring\_aws\_data\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_data_file) | Yes | Yes | Yes | Global | No |
| [**keyring\_aws\_region**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_region) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_encrypted\_file\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_encrypted_file_data) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_encrypted\_file\_password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_encrypted_file_password) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_file\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_file_data) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_hashicorp\_auth\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_auth_path) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_hashicorp\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_ca_path) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_hashicorp\_caching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_caching) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_hashicorp\_commit\_auth\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_auth_path) |  |  | Yes | Global | No |
| [**keyring\_hashicorp\_commit\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_ca_path) |  |  | Yes | Global | No |
| [**keyring\_hashicorp\_commit\_caching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_caching) |  |  | Yes | Global | No |
| [**keyring\_hashicorp\_commit\_role\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_role_id) |  |  | Yes | Global | No |
| [**keyring\_hashicorp\_commit\_server\_url**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_server_url) |  |  | Yes | Global | No |
| [**keyring\_hashicorp\_commit\_store\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_commit_store_path) |  |  | Yes | Global | No |
| [**keyring\_hashicorp\_role\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_role_id) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_hashicorp\_secret\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_secret_id) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_hashicorp\_server\_url**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_server_url) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_hashicorp\_store\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_store_path) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_oci\_ca\_certificate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_ca_certificate) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_compartment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_compartment) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_encryption\_endpoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_encryption_endpoint) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_key\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_key_file) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_key\_fingerprint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_key_fingerprint) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_management\_endpoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_management_endpoint) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_master\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_master_key) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_secrets\_endpoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_secrets_endpoint) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_tenancy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_tenancy) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_user) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_vaults\_endpoint**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_vaults_endpoint) | Yes | Yes | Yes | Global | No |
| [**keyring\_oci\_virtual\_vault**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_oci_virtual_vault) | Yes | Yes | Yes | Global | No |
| [**keyring\_okv\_conf\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_okv_conf_dir) | Yes | Yes | Yes | Global | Yes |
| [**keyring\_operations**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_operations) |  |  | Yes | Global | Yes |
| [**language**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_language) | Yes | Yes | Yes | Global | No |
| [**large\_files\_support**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_large_files_support) |  |  | Yes | Global | No |
| [**large\_page\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_large_page_size) |  |  | Yes | Global | No |
| [**large\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_large-pages) | Yes | Yes | Yes | Global | No |
| [**last\_insert\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_last_insert_id) |  |  | Yes | Session | Yes |
| [**lc\_messages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_lc-messages) | Yes | Yes | Yes | Both | Yes |
| [**lc\_messages\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_lc-messages-dir) | Yes | Yes | Yes | Global | No |
| [**lc\_time\_names**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_time_names) | Yes | Yes | Yes | Both | Yes |
| [**license**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_license) |  |  | Yes | Global | No |
| [**local\_infile**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_local_infile) | Yes | Yes | Yes | Global | Yes |
| [**lock\_order**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_debug\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_loop) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_debug\_missing\_arc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_arc) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_debug\_missing\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_key) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_debug\_missing\_unlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_unlock) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_dependencies**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_dependencies) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_extra\_dependencies**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_extra_dependencies) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_output\_directory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_output_directory) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_print\_txt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_print_txt) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_trace\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_loop) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_trace\_missing\_arc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_arc) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_trace\_missing\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_key) | Yes | Yes | Yes | Global | No |
| [**lock\_order\_trace\_missing\_unlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_unlock) | Yes | Yes | Yes | Global | No |
| [**lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_wait_timeout) | Yes | Yes | Yes | Both | Yes |
| [**locked\_in\_memory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_locked_in_memory) |  |  | Yes | Global | No |
| [**log\_bin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin) |  |  | Yes | Global | No |
| [**log\_bin\_basename**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin_basename) |  |  | Yes | Global | No |
| [**log\_bin\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_log-bin-index) | Yes | Yes | Yes | Global | No |
| [**log\_bin\_trust\_function\_creators**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin_trust_function_creators) | Yes | Yes | Yes | Global | Yes |
| [**log\_bin\_use\_v1\_row\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin_use_v1_row_events) | Yes | Yes | Yes | Global | Yes |
| [**log\_error**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) | Yes | Yes | Yes | Global | No |
| [**log\_error\_services**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_services) | Yes | Yes | Yes | Global | Yes |
| [**log\_error\_suppression\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_suppression_list) | Yes | Yes | Yes | Global | Yes |
| [**log\_error\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_verbosity) | Yes | Yes | Yes | Global | Yes |
| [**log\_output**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_output) | Yes | Yes | Yes | Global | Yes |
| [**log\_queries\_not\_using\_indexes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_queries_not_using_indexes) | Yes | Yes | Yes | Global | Yes |
| [**log\_raw**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-raw) | Yes | Yes | Yes | Global | Yes |
| [**log\_slave\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_slave_updates) | Yes | Yes | Yes | Global | No |
| [**log\_slow\_admin\_statements**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_slow_admin_statements) | Yes | Yes | Yes | Global | Yes |
| [**log\_slow\_extra**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_slow_extra) | Yes | Yes | Yes | Global | Yes |
| [**log\_slow\_slave\_statements**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_slow_slave_statements) | Yes | Yes | Yes | Global | Yes |
| [**log\_statements\_unsafe\_for\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_statements_unsafe_for_binlog) | Yes | Yes | Yes | Global | Yes |
| [**log\_syslog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog) | Yes | Yes | Yes | Global | Yes |
| [**log\_syslog\_facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_facility) | Yes | Yes | Yes | Global | Yes |
| [**log\_syslog\_include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_include_pid) | Yes | Yes | Yes | Global | Yes |
| [**log\_syslog\_tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_tag) | Yes | Yes | Yes | Global | Yes |
| [**log\_throttle\_queries\_not\_using\_indexes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_throttle_queries_not_using_indexes) | Yes | Yes | Yes | Global | Yes |
| [**log\_timestamps**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_timestamps) | Yes | Yes | Yes | Global | Yes |
| [**long\_query\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_long_query_time) | Yes | Yes | Yes | Both | Yes |
| [**low\_priority\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_low_priority_updates) | Yes | Yes | Yes | Both | Yes |
| [**lower\_case\_file\_system**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lower_case_file_system) |  |  | Yes | Global | No |
| [**lower\_case\_table\_names**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lower_case_table_names) | Yes | Yes | Yes | Global | No |
| [**mandatory\_roles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mandatory_roles) | Yes | Yes | Yes | Global | Yes |
| [**master\_info\_repository**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_master_info_repository) | Yes | Yes | Yes | Global | Yes |
| [**master\_verify\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_master_verify_checksum) | Yes | Yes | Yes | Global | Yes |
| [**max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_allowed_packet) | Yes | Yes | Yes | Both | Yes |
| [**max\_binlog\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_cache_size) | Yes | Yes | Yes | Global | Yes |
| [**max\_binlog\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_size) | Yes | Yes | Yes | Global | Yes |
| [**max\_binlog\_stmt\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_stmt_cache_size) | Yes | Yes | Yes | Global | Yes |
| [**max\_connect\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_connect_errors) | Yes | Yes | Yes | Global | Yes |
| [**max\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_connections) | Yes | Yes | Yes | Global | Yes |
| [**max\_delayed\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_delayed_threads) | Yes | Yes | Yes | Both | Yes |
| [**max\_digest\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_digest_length) | Yes | Yes | Yes | Global | No |
| [**max\_error\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_error_count) | Yes | Yes | Yes | Both | Yes |
| [**max\_execution\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_execution_time) | Yes | Yes | Yes | Both | Yes |
| [**max\_heap\_table\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_heap_table_size) | Yes | Yes | Yes | Both | Yes |
| [**max\_insert\_delayed\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_insert_delayed_threads) |  |  | Yes | Both | Yes |
| [**max\_join\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_join_size) | Yes | Yes | Yes | Both | Yes |
| [**max\_length\_for\_sort\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_length_for_sort_data) | Yes | Yes | Yes | Both | Yes |
| [**max\_points\_in\_geometry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_points_in_geometry) | Yes | Yes | Yes | Both | Yes |
| [**max\_prepared\_stmt\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_prepared_stmt_count) | Yes | Yes | Yes | Global | Yes |
| [**max\_relay\_log\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_relay_log_size) | Yes | Yes | Yes | Global | Yes |
| [**max\_seeks\_for\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_seeks_for_key) | Yes | Yes | Yes | Both | Yes |
| [**max\_sort\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_sort_length) | Yes | Yes | Yes | Both | Yes |
| [**max\_sp\_recursion\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_sp_recursion_depth) | Yes | Yes | Yes | Both | Yes |
| [**max\_user\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_user_connections) | Yes | Yes | Yes | Both | Yes |
| [**max\_write\_lock\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_write_lock_count) | Yes | Yes | Yes | Global | Yes |
| [**mecab\_rc\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mecab_rc_file) | Yes | Yes | Yes | Global | No |
| [**metadata\_locks\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_metadata_locks_cache_size) | Yes | Yes | Yes | Global | No |
| [**metadata\_locks\_hash\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_metadata_locks_hash_instances) | Yes | Yes | Yes | Global | No |
| [**min\_examined\_row\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_min_examined_row_limit) | Yes | Yes | Yes | Both | Yes |
| [**myisam\_data\_pointer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_data_pointer_size) | Yes | Yes | Yes | Global | Yes |
| [**myisam\_max\_sort\_file\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_max_sort_file_size) | Yes | Yes | Yes | Global | Yes |
| [**myisam\_mmap\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_mmap_size) | Yes | Yes | Yes | Global | No |
| [**myisam\_recover\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_recover_options) | Yes | Yes | Yes | Global | No |
| [**myisam\_repair\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_repair_threads) | Yes | Yes | Yes | Both | Yes |
| [**myisam\_sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_sort_buffer_size) | Yes | Yes | Yes | Both | Yes |
| [**myisam\_stats\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_stats_method) | Yes | Yes | Yes | Both | Yes |
| [**myisam\_use\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_use_mmap) | Yes | Yes | Yes | Global | Yes |
| [**mysql\_firewall\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_mysql_firewall_mode) | Yes | Yes | Yes | Global | Yes |
| [**mysql\_firewall\_trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_mysql_firewall_trace) | Yes | Yes | Yes | Global | Yes |
| [**mysql\_native\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mysql_native_password_proxy_users) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_bind\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_bind_address) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_compression_algorithms) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_connect\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_connect_timeout) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_deflate\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_deflate_default_compression_level) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_deflate\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_deflate_max_client_compression_level) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_document\_id\_unique\_prefix**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_document_id_unique_prefix) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_enable\_hello\_notice**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_enable_hello_notice) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_idle\_worker\_thread\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_idle_worker_thread_timeout) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_interactive\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_interactive_timeout) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_lz4\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_lz4_default_compression_level) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_lz4\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_lz4_max_client_compression_level) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_max_allowed_packet) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_max\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_max_connections) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_min\_worker\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_min_worker_threads) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_port) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_port\_open\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_port_open_timeout) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_read\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_read_timeout) | Yes | Yes | Yes | Session | Yes |
| [**mysqlx\_socket**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_socket) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_ca) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_capath) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_cert) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_cipher) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_crl) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_crlpath) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_ssl_key) | Yes | Yes | Yes | Global | No |
| [**mysqlx\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_wait_timeout) | Yes | Yes | Yes | Session | Yes |
| [**mysqlx\_write\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_write_timeout) | Yes | Yes | Yes | Session | Yes |
| [**mysqlx\_zstd\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_zstd_default_compression_level) | Yes | Yes | Yes | Global | Yes |
| [**mysqlx\_zstd\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_zstd_max_client_compression_level) | Yes | Yes | Yes | Global | Yes |
| [**named\_pipe**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_named_pipe) | Yes | Yes | Yes | Global | No |
| [**named\_pipe\_full\_access\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_named_pipe_full_access_group) | Yes | Yes | Yes | Global | No |
| [**ndb\_allow\_copying\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-allow-copying-alter-table) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_autoincrement\_prefetch\_sz**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_autoincrement_prefetch_sz) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-batch-size) | Yes | Yes | Yes | Global | No |
| [**ndb\_blob\_read\_batch\_bytes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-blob-read-batch-bytes) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_blob\_write\_batch\_bytes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-blob-write-batch-bytes) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_cache\_check\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_cache_check_time) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_clear\_apply\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_clear_apply_status) | Yes |  | Yes | Global | Yes |
| [**ndb\_cluster\_connection\_pool**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-cluster-connection-pool) | Yes | Yes | Yes | Global | No |
| [**ndb\_cluster\_connection\_pool\_nodeids**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-cluster-connection-pool-nodeids) | Yes | Yes | Yes | Global | No |
| [**Ndb\_conflict\_last\_conflict\_epoch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_last_conflict_epoch) |  |  | Yes | Global | No |
| [**ndb\_conflict\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_conflict_role) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_data\_node\_neighbour**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_data_node_neighbour) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_dbg\_check\_shares**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_dbg_check_shares) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_default\_column\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-default-column-format) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_default\_column\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_default_column_format) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_deferred\_constraints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-deferred-constraints) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_deferred\_constraints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_deferred_constraints) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_distribution**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-distribution) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_distribution**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_distribution) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_eventbuffer\_free\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_eventbuffer_free_percent) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_eventbuffer\_max\_alloc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_eventbuffer_max_alloc) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_extra\_logging**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_extra_logging) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_force\_send**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_force_send) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_fully\_replicated**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_fully_replicated) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_index\_stat\_enable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_index_stat_enable) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_index\_stat\_option**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_index_stat_option) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_join\_pushdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_join_pushdown) |  |  | Yes | Both | Yes |
| [**ndb\_log\_apply\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-apply-status) | Yes | Yes | Yes | Global | No |
| [**ndb\_log\_apply\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_apply_status) | Yes | Yes | Yes | Global | No |
| [**ndb\_log\_bin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_bin) | Yes |  | Yes | Both | No |
| [**ndb\_log\_binlog\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_binlog_index) | Yes |  | Yes | Global | Yes |
| [**ndb\_log\_empty\_epochs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-empty-epochs) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_log\_empty\_epochs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_empty_epochs) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_log\_empty\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-empty-update) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_log\_empty\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_empty_update) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_log\_exclusive\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-exclusive-reads) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_log\_exclusive\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_exclusive_reads) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_log\_fail\_terminate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-fail-terminate) | Yes | Yes | Yes | Global | No |
| [**ndb\_log\_orig**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-orig) | Yes | Yes | Yes | Global | No |
| [**ndb\_log\_orig**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_orig) | Yes | Yes | Yes | Global | No |
| [**ndb\_log\_transaction\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-transaction-id) | Yes | Yes | Yes | Global | No |
| [**ndb\_log\_transaction\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_transaction_id) |  |  | Yes | Global | No |
| [**ndb\_log\_update\_as\_write**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-update-as-write) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_log\_update\_minimal**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-update-minimal) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_log\_updated\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-log-updated-only) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_metadata\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_check) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_metadata\_check\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_check_interval) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_metadata\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_sync) |  |  | Yes | Global | Yes |
| [**ndb\_optimization\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-optimization-delay) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_optimized\_node\_selection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_optimized_node_selection) | Yes | Yes | Yes | Global | No |
| [**ndb\_read\_backup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_read_backup) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_recv\_thread\_activation\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_recv_thread_activation_threshold) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_recv\_thread\_cpu\_mask**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_recv_thread_cpu_mask) | Yes | Yes | Yes | Global | Yes |
| [**Ndb\_replica\_max\_replicated\_epoch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_replica_max_replicated_epoch) |  |  | Yes | Global | No |
| [**ndb\_report\_thresh\_binlog\_epoch\_slip**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_report_thresh_binlog_epoch_slip) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_report\_thresh\_binlog\_mem\_usage**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_report_thresh_binlog_mem_usage) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_row\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_row_checksum) |  |  | Yes | Both | Yes |
| [**ndb\_schema\_dist\_lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_schema_dist_lock_wait_timeout) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_schema\_dist\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-schema-dist-timeout) | Yes | Yes | Yes | Global | No |
| [**ndb\_schema\_dist\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_schema_dist_timeout) | Yes | Yes | Yes | Global | No |
| [**ndb\_schema\_dist\_upgrade\_allowed**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_schema_dist_upgrade_allowed) | Yes | Yes | Yes | Global | No |
| [**ndb\_show\_foreign\_key\_mock\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_show_foreign_key_mock_tables) | Yes | Yes | Yes | Global | Yes |
| [**ndb\_slave\_conflict\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_slave_conflict_role) | Yes | Yes | Yes | Global | Yes |
| [**Ndb\_slave\_max\_replicated\_epoch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_slave_max_replicated_epoch) |  |  | Yes | Global | No |
| [**Ndb\_system\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_system_name) |  |  | Yes | Global | No |
| [**ndb\_table\_no\_logging**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_table_no_logging) |  |  | Yes | Session | Yes |
| [**ndb\_table\_temporary**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_table_temporary) |  |  | Yes | Session | Yes |
| [**ndb\_use\_copying\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_use_copying_alter_table) |  |  | Yes | Both | No |
| [**ndb\_use\_exact\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_use_exact_count) |  |  | Yes | Both | Yes |
| [**ndb\_use\_transactions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_use_transactions) | Yes | Yes | Yes | Both | Yes |
| [**ndb\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_version) |  |  | Yes | Global | No |
| [**ndb\_version\_string**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_version_string) |  |  | Yes | Global | No |
| [**ndb\_wait\_connected**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-wait-connected) | Yes | Yes | Yes | Global | No |
| [**ndb\_wait\_setup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#option_mysqld_ndb-wait-setup) | Yes | Yes | Yes | Global | No |
| [**ndbinfo\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_database) |  |  | Yes | Global | No |
| [**ndbinfo\_max\_bytes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_max_bytes) | Yes |  | Yes | Both | Yes |
| [**ndbinfo\_max\_rows**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_max_rows) | Yes |  | Yes | Both | Yes |
| [**ndbinfo\_offline**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_offline) |  |  | Yes | Global | Yes |
| [**ndbinfo\_show\_hidden**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_show_hidden) | Yes |  | Yes | Both | Yes |
| [**ndbinfo\_table\_prefix**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_table_prefix) |  |  | Yes | Global | No |
| [**ndbinfo\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_version) |  |  | Yes | Global | No |
| [**net\_buffer\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_buffer_length) | Yes | Yes | Yes | Both | Yes |
| [**net\_read\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_read_timeout) | Yes | Yes | Yes | Both | Yes |
| [**net\_retry\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_retry_count) | Yes | Yes | Yes | Both | Yes |
| [**net\_write\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_write_timeout) | Yes | Yes | Yes | Both | Yes |
| [**new**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_new) | Yes | Yes | Yes | Both | Yes |
| [**ngram\_token\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ngram_token_size) | Yes | Yes | Yes | Global | No |
| [**offline\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_offline_mode) | Yes | Yes | Yes | Global | Yes |
| [**old**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old) | Yes | Yes | Yes | Global | No |
| [**old\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old_alter_table) | Yes | Yes | Yes | Both | Yes |
| [**open\_files\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_open_files_limit) | Yes | Yes | Yes | Global | No |
| [**optimizer\_prune\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_prune_level) | Yes | Yes | Yes | Both | Yes |
| [**optimizer\_search\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_search_depth) | Yes | Yes | Yes | Both | Yes |
| [**optimizer\_switch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_switch) | Yes | Yes | Yes | Both | Yes |
| [**optimizer\_trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace) | Yes | Yes | Yes | Both | Yes |
| [**optimizer\_trace\_features**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_features) | Yes | Yes | Yes | Both | Yes |
| [**optimizer\_trace\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_limit) | Yes | Yes | Yes | Both | Yes |
| [**optimizer\_trace\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_max_mem_size) | Yes | Yes | Yes | Both | Yes |
| [**optimizer\_trace\_offset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_offset) | Yes | Yes | Yes | Both | Yes |
| [**original\_commit\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_original_commit_timestamp) |  |  | Yes | Session | Yes |
| [**original\_server\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_original_server_version) |  |  | Yes | Session | Yes |
| [**parser\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_parser_max_mem_size) | Yes | Yes | Yes | Both | Yes |
| [**partial\_revokes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_partial_revokes) | Yes | Yes | Yes | Global | Yes |
| [**password\_history**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_history) | Yes | Yes | Yes | Global | Yes |
| [**password\_require\_current**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_require_current) | Yes | Yes | Yes | Global | Yes |
| [**password\_reuse\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_reuse_interval) | Yes | Yes | Yes | Global | Yes |
| [**performance\_schema**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_accounts\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_accounts_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_digests\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_digests_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_error\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_error_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_events\_stages\_history\_long\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_stages_history_long_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_events\_stages\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_stages_history_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_events\_statements\_history\_long\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_statements_history_long_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_events\_statements\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_statements_history_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_events\_transactions\_history\_long\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_transactions_history_long_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_events\_transactions\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_transactions_history_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_events\_waits\_history\_long\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_waits_history_long_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_events\_waits\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_events_waits_history_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_hosts\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_hosts_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_cond\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_cond_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_cond\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_cond_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_digest\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_digest_length) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_digest\_sample\_age**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_digest_sample_age) | Yes | Yes | Yes | Global | Yes |
| [**performance\_schema\_max\_file\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_file_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_file\_handles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_file_handles) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_file\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_file_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_index\_stat**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_index_stat) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_memory\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_memory_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_metadata\_locks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_metadata_locks) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_mutex\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_mutex_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_mutex\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_mutex_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_prepared\_statements\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_prepared_statements_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_program\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_program_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_rwlock\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_rwlock_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_rwlock\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_rwlock_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_socket\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_socket_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_socket\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_socket_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_sql\_text\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_sql_text_length) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_stage\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_stage_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_statement\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_statement_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_statement\_stack**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_statement_stack) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_table\_handles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_table_handles) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_table\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_table_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_table\_lock\_stat**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_table_lock_stat) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_thread\_classes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_thread_classes) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_max\_thread\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_thread_instances) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_session\_connect\_attrs\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_session_connect_attrs_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_setup\_actors\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_setup_actors_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_setup\_objects\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_setup_objects_size) | Yes | Yes | Yes | Global | No |
| [**performance\_schema\_show\_processlist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_show_processlist) | Yes | Yes | Yes | Global | Yes |
| [**performance\_schema\_users\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_users_size) | Yes | Yes | Yes | Global | No |
| [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) | Yes | Yes | Yes | Global | No |
| [**persisted\_globals\_load**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persisted_globals_load) | Yes | Yes | Yes | Global | No |
| [**pid\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pid_file) | Yes | Yes | Yes | Global | No |
| [**plugin\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_plugin_dir) | Yes | Yes | Yes | Global | No |
| [**plugin\_load**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load) | Yes | Yes | Yes | Global | No |
| [**plugin\_load\_add**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load-add) | Yes | Yes | Yes | Global | No |
| [**port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_port) | Yes | Yes | Yes | Global | No |
| [**preload\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_preload_buffer_size) | Yes | Yes | Yes | Both | Yes |
| [**print\_identified\_with\_as\_hex**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_print_identified_with_as_hex) | Yes | Yes | Yes | Both | Yes |
| [**profiling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_profiling) |  |  | Yes | Both | Yes |
| [**profiling\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_profiling_history_size) | Yes | Yes | Yes | Both | Yes |
| [**protocol\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_protocol_compression_algorithms) | Yes | Yes | Yes | Global | Yes |
| [**protocol\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_protocol_version) |  |  | Yes | Global | No |
| [**proxy\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_proxy_user) |  |  | Yes | Session | No |
| [**pseudo\_slave\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_slave_mode) |  |  | Yes | Session | Yes |
| [**pseudo\_thread\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_thread_id) |  |  | Yes | Session | Yes |
| [**query\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_query_alloc_block_size) | Yes | Yes | Yes | Both | Yes |
| [**query\_prealloc\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_query_prealloc_size) | Yes | Yes | Yes | Both | Yes |
| [**rand\_seed1**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed1) |  |  | Yes | Session | Yes |
| [**rand\_seed2**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed2) |  |  | Yes | Session | Yes |
| [**range\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_range_alloc_block_size) | Yes | Yes | Yes | Both | Yes |
| [**range\_optimizer\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_range_optimizer_max_mem_size) | Yes | Yes | Yes | Both | Yes |
| [**rbr\_exec\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rbr_exec_mode) |  |  | Yes | Both | Yes |
| [**read\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_buffer_size) | Yes | Yes | Yes | Both | Yes |
| [**read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_only) | Yes | Yes | Yes | Global | Yes |
| [**read\_rnd\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_rnd_buffer_size) | Yes | Yes | Yes | Both | Yes |
| [**regexp\_stack\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_regexp_stack_limit) | Yes | Yes | Yes | Global | Yes |
| [**regexp\_time\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_regexp_time_limit) | Yes | Yes | Yes | Global | Yes |
| [**relay\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log) | Yes | Yes | Yes | Global | No |
| [**relay\_log\_basename**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_basename) |  |  | Yes | Global | No |
| [**relay\_log\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_index) | Yes | Yes | Yes | Global | No |
| [**relay\_log\_info\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_info_file) | Yes | Yes | Yes | Global | No |
| [**relay\_log\_info\_repository**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_info_repository) | Yes | Yes | Yes | Global | Yes |
| [**relay\_log\_purge**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_purge) | Yes | Yes | Yes | Global | Yes |
| [**relay\_log\_recovery**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_recovery) | Yes | Yes | Yes | Global | No |
| [**relay\_log\_space\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_space_limit) | Yes | Yes | Yes | Global | No |
| [**replication\_optimize\_for\_static\_plugin\_config**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_replication_optimize_for_static_plugin_config) | Yes | Yes | Yes | Global | Yes |
| [**replication\_sender\_observe\_commit\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_replication_sender_observe_commit_only) | Yes | Yes | Yes | Global | Yes |
| [**report\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_report_host) | Yes | Yes | Yes | Global | No |
| [**report\_password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_report_password) | Yes | Yes | Yes | Global | No |
| [**report\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_report_port) | Yes | Yes | Yes | Global | No |
| [**report\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_report_user) | Yes | Yes | Yes | Global | No |
| [**require\_row\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_require_row_format) |  |  | Yes | Session | Yes |
| [**require\_secure\_transport**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_require_secure_transport) | Yes | Yes | Yes | Global | Yes |
| [**resultset\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_resultset_metadata) |  |  | Yes | Session | Yes |
| [**rewriter\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rewriter_enabled) |  |  | Yes | Global | Yes |
| [**rewriter\_verbose**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rewriter_verbose) |  |  | Yes | Global | Yes |
| [**rpl\_read\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_read_size) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_semi\_sync\_master\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_enabled) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_semi\_sync\_master\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_timeout) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_semi\_sync\_master\_trace\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_trace_level) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_semi\_sync\_master\_wait\_for\_slave\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_for_slave_count) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_semi\_sync\_master\_wait\_no\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_no_slave) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_semi\_sync\_master\_wait\_point**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_point) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_semi\_sync\_slave\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_slave_enabled) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_semi\_sync\_slave\_trace\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_slave_trace_level) | Yes | Yes | Yes | Global | Yes |
| [**rpl\_stop\_slave\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_stop_slave_timeout) | Yes | Yes | Yes | Global | Yes |
| [**schema\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_schema_definition_cache) | Yes | Yes | Yes | Global | Yes |
| [**secondary\_engine\_cost\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_secondary_engine_cost_threshold) |  |  | Yes | Session | Yes |
| [**secure\_file\_priv**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_secure_file_priv) | Yes | Yes | Yes | Global | No |
| [**select\_into\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_buffer_size) | Yes | Yes | Yes | Both | Yes |
| [**select\_into\_disk\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_disk_sync) | Yes | Yes | Yes | Both | Yes |
| [**select\_into\_disk\_sync\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_disk_sync_delay) | Yes | Yes | Yes | Both | Yes |
| [**server\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_server_id) | Yes | Yes | Yes | Global | Yes |
| [**server\_id\_bits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_server_id_bits) | Yes | Yes | Yes | Global | No |
| [**server\_uuid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_server_uuid) |  |  | Yes | Global | No |
| [**session\_track\_gtids**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_gtids) | Yes | Yes | Yes | Both | Yes |
| [**session\_track\_schema**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_schema) | Yes | Yes | Yes | Both | Yes |
| [**session\_track\_state\_change**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_state_change) | Yes | Yes | Yes | Both | Yes |
| [**session\_track\_system\_variables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_system_variables) | Yes | Yes | Yes | Both | Yes |
| [**session\_track\_transaction\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_transaction_info) | Yes | Yes | Yes | Both | Yes |
| [**sha256\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_auto_generate_rsa_keys) | Yes | Yes | Yes | Global | No |
| [**sha256\_password\_private\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_private_key_path) | Yes | Yes | Yes | Global | No |
| [**sha256\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_proxy_users) | Yes | Yes | Yes | Global | Yes |
| [**sha256\_password\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_public_key_path) | Yes | Yes | Yes | Global | No |
| [**shared\_memory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_shared_memory) | Yes | Yes | Yes | Global | No |
| [**shared\_memory\_base\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_shared_memory_base_name) | Yes | Yes | Yes | Global | No |
| [**show\_create\_table\_skip\_secondary\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_create_table_skip_secondary_engine) | Yes | Yes | Yes | Session | Yes |
| [**show\_create\_table\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_create_table_verbosity) | Yes | Yes | Yes | Both | Yes |
| [**show\_old\_temporals**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_old_temporals) | Yes | Yes | Yes | Both | Yes |
| [**skip\_external\_locking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_external_locking) | Yes | Yes | Yes | Global | No |
| [**skip\_name\_resolve**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_name_resolve) | Yes | Yes | Yes | Global | No |
| [**skip\_networking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_networking) | Yes | Yes | Yes | Global | No |
| [**skip\_show\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-show-database) | Yes | Yes | Yes | Global | No |
| [**skip\_slave\_start**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_skip-slave-start) | Yes | Yes | Yes | Global | No |
| [**slave\_allow\_batching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_slave_allow_batching) | Yes | Yes | Yes | Global | Yes |
| [**slave\_checkpoint\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_checkpoint_group) | Yes | Yes | Yes | Global | Yes |
| [**slave\_checkpoint\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_checkpoint_period) | Yes | Yes | Yes | Global | Yes |
| [**slave\_compressed\_protocol**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_compressed_protocol) | Yes | Yes | Yes | Global | Yes |
| [**slave\_exec\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_exec_mode) | Yes | Yes | Yes | Global | Yes |
| [**slave\_load\_tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_load_tmpdir) | Yes | Yes | Yes | Global | No |
| [**slave\_max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_max_allowed_packet) | Yes | Yes | Yes | Global | Yes |
| [**slave\_net\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_net_timeout) | Yes | Yes | Yes | Global | Yes |
| [**slave\_parallel\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_parallel_type) | Yes | Yes | Yes | Global | Yes |
| [**slave\_parallel\_workers**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_parallel_workers) | Yes | Yes | Yes | Global | Yes |
| [**slave\_pending\_jobs\_size\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_pending_jobs_size_max) | Yes | Yes | Yes | Global | Yes |
| [**slave\_preserve\_commit\_order**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_preserve_commit_order) | Yes | Yes | Yes | Global | Yes |
| [**slave\_rows\_search\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_rows_search_algorithms) | Yes | Yes | Yes | Global | Yes |
| [**slave\_skip\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#option_mysqld_slave-skip-errors) | Yes | Yes | Yes | Global | No |
| [**slave\_sql\_verify\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_sql_verify_checksum) | Yes | Yes | Yes | Global | Yes |
| [**slave\_transaction\_retries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_transaction_retries) | Yes | Yes | Yes | Global | Yes |
| [**slave\_type\_conversions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_type_conversions) | Yes | Yes | Yes | Global | Yes |
| [**slow\_launch\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_launch_time) | Yes | Yes | Yes | Global | Yes |
| [**slow\_query\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log) | Yes | Yes | Yes | Global | Yes |
| [**slow\_query\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log_file) | Yes | Yes | Yes | Global | Yes |
| [**socket**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_socket) | Yes | Yes | Yes | Global | No |
| [**sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sort_buffer_size) | Yes | Yes | Yes | Both | Yes |
| [**sql\_auto\_is\_null**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_auto_is_null) |  |  | Yes | Both | Yes |
| [**sql\_big\_selects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_big_selects) |  |  | Yes | Both | Yes |
| [**sql\_buffer\_result**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_buffer_result) |  |  | Yes | Both | Yes |
| [**sql\_log\_bin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sql_log_bin) |  |  | Yes | Session | Yes |
| [**sql\_log\_off**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_log_off) |  |  | Yes | Both | Yes |
| [**sql\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_sql-mode) | Yes | Yes | Yes | Both | Yes |
| [**sql\_notes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_notes) |  |  | Yes | Both | Yes |
| [**sql\_quote\_show\_create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_quote_show_create) |  |  | Yes | Both | Yes |
| [**sql\_require\_primary\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_require_primary_key) | Yes | Yes | Yes | Both | Yes |
| [**sql\_safe\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_safe_updates) |  |  | Yes | Both | Yes |
| [**sql\_select\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_select_limit) |  |  | Yes | Both | Yes |
| [**sql\_slave\_skip\_counter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sql_slave_skip_counter) |  |  | Yes | Global | Yes |
| [**sql\_warnings**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_warnings) |  |  | Yes | Both | Yes |
| [**ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_ca) | Yes | Yes | Yes | Global | Varies |
| [**ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_capath) | Yes | Yes | Yes | Global | Varies |
| [**ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_cert) | Yes | Yes | Yes | Global | Varies |
| [**ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_cipher) | Yes | Yes | Yes | Global | Varies |
| [**ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_crl) | Yes | Yes | Yes | Global | Varies |
| [**ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_crlpath) | Yes | Yes | Yes | Global | Varies |
| [**ssl\_fips\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_fips_mode) | Yes | Yes | Yes | Global | Yes |
| [**ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_key) | Yes | Yes | Yes | Global | Varies |
| [**stored\_program\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_stored_program_cache) | Yes | Yes | Yes | Global | Yes |
| [**stored\_program\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_stored_program_definition_cache) | Yes | Yes | Yes | Global | Yes |
| [**super\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_super_read_only) | Yes | Yes | Yes | Global | Yes |
| [**sync\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_binlog) | Yes | Yes | Yes | Global | Yes |
| [**sync\_master\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_master_info) | Yes | Yes | Yes | Global | Yes |
| [**sync\_relay\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_relay_log) | Yes | Yes | Yes | Global | Yes |
| [**sync\_relay\_log\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_relay_log_info) | Yes | Yes | Yes | Global | Yes |
| [**syseventlog.facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.facility) | Yes | Yes | Yes | Global | Yes |
| [**syseventlog.include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.include_pid) | Yes | Yes | Yes | Global | Yes |
| [**syseventlog.tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.tag) | Yes | Yes | Yes | Global | Yes |
| [**system\_time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_system_time_zone) |  |  | Yes | Global | No |
| [**table\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_definition_cache) | Yes | Yes | Yes | Global | Yes |
| [**table\_encryption\_privilege\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_encryption_privilege_check) | Yes | Yes | Yes | Global | Yes |
| [**table\_open\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_open_cache) | Yes | Yes | Yes | Global | Yes |
| [**table\_open\_cache\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_open_cache_instances) | Yes | Yes | Yes | Global | No |
| [**tablespace\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tablespace_definition_cache) | Yes | Yes | Yes | Global | Yes |
| [**temptable\_max\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_max_mmap) | Yes | Yes | Yes | Global | Yes |
| [**temptable\_max\_ram**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_max_ram) | Yes | Yes | Yes | Global | Yes |
| [**temptable\_use\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_use_mmap) | Yes | Yes | Yes | Global | Yes |
| [**thread\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_cache_size) | Yes | Yes | Yes | Global | Yes |
| [**thread\_handling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_handling) | Yes | Yes | Yes | Global | No |
| [**thread\_pool\_algorithm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_algorithm) | Yes | Yes | Yes | Global | No |
| [**thread\_pool\_high\_priority\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_high_priority_connection) | Yes | Yes | Yes | Both | Yes |
| [**thread\_pool\_max\_active\_query\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_max_active_query_threads) | Yes | Yes | Yes | Global | Yes |
| [**thread\_pool\_max\_unused\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_max_unused_threads) | Yes | Yes | Yes | Global | Yes |
| [**thread\_pool\_prio\_kickup\_timer**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_prio_kickup_timer) | Yes | Yes | Yes | Global | Yes |
| [**thread\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_size) | Yes | Yes | Yes | Global | No |
| [**thread\_pool\_stall\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_stall_limit) | Yes | Yes | Yes | Global | Yes |
| [**thread\_stack**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_stack) | Yes | Yes | Yes | Global | No |
| [**time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_time_zone) |  |  | Yes | Both | Yes |
| [**timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_timestamp) |  |  | Yes | Session | Yes |
| [**tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tls_ciphersuites) | Yes | Yes | Yes | Global | Yes |
| [**tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tls_version) | Yes | Yes | Yes | Global | Varies |
| [**tmp\_table\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tmp_table_size) | Yes | Yes | Yes | Both | Yes |
| [**tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_tmpdir) | Yes | Yes | Yes | Global | No |
| [**transaction\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_alloc_block_size) | Yes | Yes | Yes | Both | Yes |
| [**transaction\_allow\_batching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_transaction_allow_batching) |  |  | Yes | Session | Yes |
| [**transaction\_isolation**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_transaction-isolation) | Yes | Yes | Yes | Both | Yes |
| [**transaction\_prealloc\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_prealloc_size) | Yes | Yes | Yes | Both | Yes |
| [**transaction\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_transaction-read-only) | Yes | Yes | Yes | Both | Yes |
| [**transaction\_write\_set\_extraction**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_transaction_write_set_extraction) | Yes | Yes | Yes | Both | Yes |
| [**unique\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_unique_checks) |  |  | Yes | Both | Yes |
| [**updatable\_views\_with\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_updatable_views_with_limit) | Yes | Yes | Yes | Both | Yes |
| [**use\_secondary\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_use_secondary_engine) |  |  | Yes | Session | Yes |
| [**validate\_password\_check\_user\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_check_user_name) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password\_dictionary\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_dictionary_file) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_length) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password\_mixed\_case\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_mixed_case_count) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password\_number\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_number_count) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_policy) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password\_special\_char\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_special_char_count) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password.check\_user\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.check_user_name) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password.dictionary\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.dictionary_file) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password.length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.length) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password.mixed\_case\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.mixed_case_count) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password.number\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.number_count) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password.policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.policy) | Yes | Yes | Yes | Global | Yes |
| [**validate\_password.special\_char\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.special_char_count) | Yes | Yes | Yes | Global | Yes |
| [**version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version) |  |  | Yes | Global | No |
| [**version\_comment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_comment) |  |  | Yes | Global | No |
| [**version\_compile\_machine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_machine) |  |  | Yes | Global | No |
| [**version\_compile\_os**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_os) |  |  | Yes | Global | No |
| [**version\_compile\_zlib**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_zlib) |  |  | Yes | Global | No |
| [**version\_tokens\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_tokens_session) | Yes | Yes | Yes | Both | Yes |
| [**version\_tokens\_session\_number**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_tokens_session_number) | Yes | Yes | Yes | Both | No |
| [**wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_wait_timeout) | Yes | Yes | Yes | Both | Yes |
| [**warning\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_warning_count) |  |  | Yes | Session | No |
| [**windowing\_use\_high\_precision**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_windowing_use_high_precision) | Yes | Yes | Yes | Both | Yes |

***Notes:***

1. 这个选项是动态的，但只应由服务器设置。你不应该手动设置这个变量。

### 5.1.6服务端状态码参考

下表列出了在mysqld中适用的所有状态变量。

该表列出了每个变量的数据类型和范围。最后一列指出每个变量的范围是全局、会话，还是两者。关于设置和使用这些变量的细节，请参见相应的项目描述。在适当的地方，还提供了有关这些项目的进一步信息的直接链接。

**Table 5.3 Status Variable Summary**

|  |  |  |
| --- | --- | --- |
| Variable Name | Variable Type | Variable Scope |
| [Aborted\_clients](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Aborted_clients) | Integer | Global |
| [Aborted\_connects](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Aborted_connects) | Integer | Global |
| [Acl\_cache\_items\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Acl_cache_items_count) | Integer | Global |
| [Audit\_log\_current\_size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_current_size) | Integer | Global |
| [Audit\_log\_event\_max\_drop\_size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_event_max_drop_size) | Integer | Global |
| [Audit\_log\_events](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_events) | Integer | Global |
| [Audit\_log\_events\_filtered](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_events_filtered) | Integer | Global |
| [Audit\_log\_events\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_events_lost) | Integer | Global |
| [Audit\_log\_events\_written](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_events_written) | Integer | Global |
| [Audit\_log\_total\_size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_total_size) | Integer | Global |
| [Audit\_log\_write\_waits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Audit_log_write_waits) | Integer | Global |
| [Authentication\_ldap\_sasl\_supported\_methods](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Authentication_ldap_sasl_supported_methods) | String | Global |
| [Binlog\_cache\_disk\_use](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Binlog_cache_disk_use) | Integer | Global |
| [Binlog\_cache\_use](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Binlog_cache_use) | Integer | Global |
| [Binlog\_stmt\_cache\_disk\_use](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Binlog_stmt_cache_disk_use) | Integer | Global |
| [Binlog\_stmt\_cache\_use](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Binlog_stmt_cache_use) | Integer | Global |
| [Bytes\_received](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Bytes_received) | Integer | Both |
| [Bytes\_sent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Bytes_sent) | Integer | Both |
| [Caching\_sha2\_password\_rsa\_public\_key](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Caching_sha2_password_rsa_public_key) | String | Global |
| [Com\_admin\_commands](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_db](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_event](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_function](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_procedure](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_resource\_group](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_alter\_server](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_table](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_tablespace](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_alter\_user\_default\_role](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_analyze](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_assign\_to\_keycache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_begin](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_binlog](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_call\_procedure](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_change\_db](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_change\_master](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_change\_repl\_filter](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_check](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_checksum](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_clone](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_commit](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_db](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_event](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_function](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_index](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_procedure](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_resource\_group](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_create\_role](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_create\_server](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_table](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_trigger](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_udf](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_create\_view](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_dealloc\_sql](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_delete](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_delete\_multi](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_do](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_db](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_event](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_function](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_index](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_procedure](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_resource\_group](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_drop\_role](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_drop\_server](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_table](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_trigger](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_drop\_view](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_empty\_query](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_execute\_sql](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_explain\_other](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_flush](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_get\_diagnostics](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_grant](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_grant\_roles](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_group\_replication\_start](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_group\_replication\_stop](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_ha\_close](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_ha\_open](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_ha\_read](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_help](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_insert](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_insert\_select](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_install\_component](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_install\_plugin](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_kill](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_load](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_lock\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_optimize](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_preload\_keys](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_prepare\_sql](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_purge](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_purge\_before\_date](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_release\_savepoint](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_rename\_table](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_rename\_user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_repair](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_replace](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_replace\_select](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_replica\_start](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_replica\_stop](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_reset](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_resignal](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_restart](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_revoke](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_revoke\_all](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_revoke\_roles](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_rollback](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_rollback\_to\_savepoint](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_savepoint](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_select](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_set\_option](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_set\_resource\_group](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_set\_role](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_show\_authors](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_binlog\_events](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_binlogs](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_charsets](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_collations](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_contributors](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_create\_db](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_create\_event](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_create\_func](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_create\_proc](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_create\_table](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_create\_trigger](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_create\_user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_databases](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_engine\_logs](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_engine\_mutex](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_engine\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_errors](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_events](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_fields](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_function\_code](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_function\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_grants](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_keys](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_master\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_ndb\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_open\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_plugins](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_privileges](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_procedure\_code](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_procedure\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_processlist](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_profile](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_profiles](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_relaylog\_events](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_replica\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_replicas](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_slave\_hosts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_slave\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_storage\_engines](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_table\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_triggers](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_show\_warnings](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_shutdown](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_signal](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_slave\_start](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_slave\_stop](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_stmt\_close](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_stmt\_execute](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_stmt\_fetch](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_stmt\_prepare](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_stmt\_reprepare](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_stmt\_reset](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_stmt\_send\_long\_data](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_truncate](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_uninstall\_component](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Global |
| [Com\_uninstall\_plugin](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_unlock\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_update](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_update\_multi](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_xa\_commit](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_xa\_end](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_xa\_prepare](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_xa\_recover](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_xa\_rollback](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Com\_xa\_start](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Com_xxx) | Integer | Both |
| [Compression](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Compression) | Integer | Session |
| [Compression\_algorithm](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Compression_algorithm) | String | Global |
| [Compression\_level](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Compression_level) | Integer | Global |
| [Connection\_control\_delay\_generated](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Connection_control_delay_generated) | Integer | Global |
| [Connection\_errors\_accept](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_accept) | Integer | Global |
| [Connection\_errors\_internal](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_internal) | Integer | Global |
| [Connection\_errors\_max\_connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_max_connections) | Integer | Global |
| [Connection\_errors\_peer\_address](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_peer_address) | Integer | Global |
| [Connection\_errors\_select](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_select) | Integer | Global |
| [Connection\_errors\_tcpwrap](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connection_errors_tcpwrap) | Integer | Global |
| [Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connections) | Integer | Global |
| [Created\_tmp\_disk\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Created_tmp_disk_tables) | Integer | Both |
| [Created\_tmp\_files](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Created_tmp_files) | Integer | Global |
| [Created\_tmp\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Created_tmp_tables) | Integer | Both |
| [Current\_tls\_ca](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_ca) | File name | Global |
| [Current\_tls\_capath](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_capath) | Directory name | Global |
| [Current\_tls\_cert](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_cert) | File name | Global |
| [Current\_tls\_cipher](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_cipher) | String | Global |
| [Current\_tls\_ciphersuites](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_ciphersuites) | String | Global |
| [Current\_tls\_crl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_crl) | File name | Global |
| [Current\_tls\_crlpath](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_crlpath) | Directory name | Global |
| [Current\_tls\_key](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_key) | File name | Global |
| [Current\_tls\_version](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Current_tls_version) | String | Global |
| [Delayed\_errors](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Delayed_errors) | Integer | Global |
| [Delayed\_insert\_threads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Delayed_insert_threads) | Integer | Global |
| [Delayed\_writes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Delayed_writes) | Integer | Global |
| [dragnet.Status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_dragnet.Status) | String | Global |
| [Error\_log\_buffered\_bytes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Error_log_buffered_bytes) | Integer | Global |
| [Error\_log\_buffered\_events](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Error_log_buffered_events) | Integer | Global |
| [Error\_log\_expired\_events](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Error_log_expired_events) | Integer | Global |
| [Error\_log\_latest\_write](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Error_log_latest_write) | Integer | Global |
| [Firewall\_access\_denied](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Firewall_access_denied) | Integer | Global |
| [Firewall\_access\_granted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Firewall_access_granted) | Integer | Global |
| [Firewall\_cached\_entries](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_Firewall_cached_entries) | Integer | Global |
| [Flush\_commands](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Flush_commands) | Integer | Global |
| [group\_replication\_primary\_member](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_group_replication_primary_member) | String | Global |
| [Handler\_commit](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_commit) | Integer | Both |
| [Handler\_delete](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_delete) | Integer | Both |
| [Handler\_discover](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Handler_discover) | Integer | Both |
| [Handler\_external\_lock](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_external_lock) | Integer | Both |
| [Handler\_mrr\_init](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_mrr_init) | Integer | Both |
| [Handler\_prepare](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_prepare) | Integer | Both |
| [Handler\_read\_first](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_first) | Integer | Both |
| [Handler\_read\_key](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_key) | Integer | Both |
| [Handler\_read\_last](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_last) | Integer | Both |
| [Handler\_read\_next](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_next) | Integer | Both |
| [Handler\_read\_prev](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_prev) | Integer | Both |
| [Handler\_read\_rnd](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_rnd) | Integer | Both |
| [Handler\_read\_rnd\_next](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_read_rnd_next) | Integer | Both |
| [Handler\_rollback](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_rollback) | Integer | Both |
| [Handler\_savepoint](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_savepoint) | Integer | Both |
| [Handler\_savepoint\_rollback](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_savepoint_rollback) | Integer | Both |
| [Handler\_update](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_update) | Integer | Both |
| [Handler\_write](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Handler_write) | Integer | Both |
| [Innodb\_buffer\_pool\_bytes\_data](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_bytes_data) | Integer | Global |
| [Innodb\_buffer\_pool\_bytes\_dirty](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_bytes_dirty) | Integer | Global |
| [Innodb\_buffer\_pool\_dump\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_dump_status) | String | Global |
| [Innodb\_buffer\_pool\_load\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_load_status) | String | Global |
| [Innodb\_buffer\_pool\_pages\_data](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_data) | Integer | Global |
| [Innodb\_buffer\_pool\_pages\_dirty](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_dirty) | Integer | Global |
| [Innodb\_buffer\_pool\_pages\_flushed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_flushed) | Integer | Global |
| [Innodb\_buffer\_pool\_pages\_free](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_free) | Integer | Global |
| [Innodb\_buffer\_pool\_pages\_latched](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_latched) | Integer | Global |
| [Innodb\_buffer\_pool\_pages\_misc](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_misc) | Integer | Global |
| [Innodb\_buffer\_pool\_pages\_total](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_total) | Integer | Global |
| [Innodb\_buffer\_pool\_read\_ahead](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_read_ahead) | Integer | Global |
| [Innodb\_buffer\_pool\_read\_ahead\_evicted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_read_ahead_evicted) | Integer | Global |
| [Innodb\_buffer\_pool\_read\_ahead\_rnd](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_read_ahead_rnd) | Integer | Global |
| [Innodb\_buffer\_pool\_read\_requests](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_read_requests) | Integer | Global |
| [Innodb\_buffer\_pool\_reads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_reads) | Integer | Global |
| [Innodb\_buffer\_pool\_resize\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_resize_status) | String | Global |
| [Innodb\_buffer\_pool\_wait\_free](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_wait_free) | Integer | Global |
| [Innodb\_buffer\_pool\_write\_requests](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_write_requests) | Integer | Global |
| [Innodb\_data\_fsyncs](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_fsyncs) | Integer | Global |
| [Innodb\_data\_pending\_fsyncs](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_pending_fsyncs) | Integer | Global |
| [Innodb\_data\_pending\_reads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_pending_reads) | Integer | Global |
| [Innodb\_data\_pending\_writes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_pending_writes) | Integer | Global |
| [Innodb\_data\_read](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_read) | Integer | Global |
| [Innodb\_data\_reads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_reads) | Integer | Global |
| [Innodb\_data\_writes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_writes) | Integer | Global |
| [Innodb\_data\_written](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_data_written) | Integer | Global |
| [Innodb\_dblwr\_pages\_written](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_dblwr_pages_written) | Integer | Global |
| [Innodb\_dblwr\_writes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_dblwr_writes) | Integer | Global |
| [Innodb\_have\_atomic\_builtins](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_have_atomic_builtins) | Integer | Global |
| [Innodb\_log\_waits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_log_waits) | Integer | Global |
| [Innodb\_log\_write\_requests](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_log_write_requests) | Integer | Global |
| [Innodb\_log\_writes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_log_writes) | Integer | Global |
| [Innodb\_num\_open\_files](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_num_open_files) | Integer | Global |
| [Innodb\_os\_log\_fsyncs](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_os_log_fsyncs) | Integer | Global |
| [Innodb\_os\_log\_pending\_fsyncs](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_os_log_pending_fsyncs) | Integer | Global |
| [Innodb\_os\_log\_pending\_writes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_os_log_pending_writes) | Integer | Global |
| [Innodb\_os\_log\_written](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_os_log_written) | Integer | Global |
| [Innodb\_page\_size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_page_size) | Integer | Global |
| [Innodb\_pages\_created](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_pages_created) | Integer | Global |
| [Innodb\_pages\_read](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_pages_read) | Integer | Global |
| [Innodb\_pages\_written](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_pages_written) | Integer | Global |
| [Innodb\_redo\_log\_enabled](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_redo_log_enabled) | Boolean | Global |
| [Innodb\_row\_lock\_current\_waits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_current_waits) | Integer | Global |
| [Innodb\_row\_lock\_time](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_time) | Integer | Global |
| [Innodb\_row\_lock\_time\_avg](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_time_avg) | Integer | Global |
| [Innodb\_row\_lock\_time\_max](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_time_max) | Integer | Global |
| [Innodb\_row\_lock\_waits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_row_lock_waits) | Integer | Global |
| [Innodb\_rows\_deleted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_rows_deleted) | Integer | Global |
| [Innodb\_rows\_inserted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_rows_inserted) | Integer | Global |
| [Innodb\_rows\_read](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_rows_read) | Integer | Global |
| [Innodb\_rows\_updated](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_rows_updated) | Integer | Global |
| [Innodb\_system\_rows\_deleted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_system_rows_deleted) | Integer | Global |
| [Innodb\_system\_rows\_inserted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_system_rows_inserted) | Integer | Global |
| [Innodb\_system\_rows\_read](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_system_rows_read) | Integer | Global |
| [Innodb\_truncated\_status\_writes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_truncated_status_writes) | Integer | Global |
| [Innodb\_undo\_tablespaces\_active](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_undo_tablespaces_active) | Integer | Global |
| [Innodb\_undo\_tablespaces\_explicit](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_undo_tablespaces_explicit) | Integer | Global |
| [Innodb\_undo\_tablespaces\_implicit](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_undo_tablespaces_implicit) | Integer | Global |
| [Innodb\_undo\_tablespaces\_total](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_undo_tablespaces_total) | Integer | Global |
| [Key\_blocks\_not\_flushed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_blocks_not_flushed) | Integer | Global |
| [Key\_blocks\_unused](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_blocks_unused) | Integer | Global |
| [Key\_blocks\_used](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_blocks_used) | Integer | Global |
| [Key\_read\_requests](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_read_requests) | Integer | Global |
| [Key\_reads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_reads) | Integer | Global |
| [Key\_write\_requests](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_write_requests) | Integer | Global |
| [Key\_writes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Key_writes) | Integer | Global |
| [Last\_query\_cost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Last_query_cost) | Numeric | Session |
| [Last\_query\_partial\_plans](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Last_query_partial_plans) | Integer | Session |
| [Locked\_connects](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Locked_connects) | Integer | Global |
| [Max\_execution\_time\_exceeded](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_execution_time_exceeded) | Integer | Both |
| [Max\_execution\_time\_set](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_execution_time_set) | Integer | Both |
| [Max\_execution\_time\_set\_failed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_execution_time_set_failed) | Integer | Both |
| [Max\_used\_connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_used_connections) | Integer | Global |
| [Max\_used\_connections\_time](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Max_used_connections_time) | Datetime | Global |
| [mecab\_charset](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_mecab_charset) | String | Global |
| [Mysqlx\_aborted\_clients](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_aborted_clients) | Integer | Global |
| [Mysqlx\_address](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_address) | String | Global |
| [Mysqlx\_bytes\_received](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_received) | Integer | Both |
| [Mysqlx\_bytes\_received\_compressed\_payload](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_received_compressed_payload) | Integer | Both |
| [Mysqlx\_bytes\_received\_uncompressed\_frame](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_received_uncompressed_frame) | Integer | Both |
| [Mysqlx\_bytes\_sent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_sent) | Integer | Both |
| [Mysqlx\_bytes\_sent\_compressed\_payload](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_sent_compressed_payload) | Integer | Both |
| [Mysqlx\_bytes\_sent\_uncompressed\_frame](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_bytes_sent_uncompressed_frame) | Integer | Both |
| [Mysqlx\_compression\_algorithm](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_compression_algorithm) | String | Session |
| [Mysqlx\_compression\_level](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_compression_level) | String | Session |
| [Mysqlx\_connection\_accept\_errors](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connection_accept_errors) | Integer | Both |
| [Mysqlx\_connection\_errors](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connection_errors) | Integer | Both |
| [Mysqlx\_connections\_accepted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connections_accepted) | Integer | Global |
| [Mysqlx\_connections\_closed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connections_closed) | Integer | Global |
| [Mysqlx\_connections\_rejected](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_connections_rejected) | Integer | Global |
| [Mysqlx\_crud\_create\_view](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_create_view) | Integer | Both |
| [Mysqlx\_crud\_delete](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_delete) | Integer | Both |
| [Mysqlx\_crud\_drop\_view](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_drop_view) | Integer | Both |
| [Mysqlx\_crud\_find](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_find) | Integer | Both |
| [Mysqlx\_crud\_insert](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_insert) | Integer | Both |
| [Mysqlx\_crud\_modify\_view](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_modify_view) | Integer | Both |
| [Mysqlx\_crud\_update](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_crud_update) | Integer | Both |
| [Mysqlx\_cursor\_close](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_cursor_close) | Integer | Both |
| [Mysqlx\_cursor\_fetch](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_cursor_fetch) | Integer | Both |
| [Mysqlx\_cursor\_open](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_cursor_open) | Integer | Both |
| [Mysqlx\_errors\_sent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_errors_sent) | Integer | Both |
| Mysqlx\_errors\_unknown\_message\_type | Integer | Both |
| [Mysqlx\_expect\_close](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_expect_close) | Integer | Both |
| [Mysqlx\_expect\_open](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_expect_open) | Integer | Both |
| [Mysqlx\_init\_error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_init_error) | Integer | Both |
| [Mysqlx\_messages\_sent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_messages_sent) | Integer | Both |
| [Mysqlx\_notice\_global\_sent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_notice_global_sent) | Integer | Both |
| [Mysqlx\_notice\_other\_sent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_notice_other_sent) | Integer | Both |
| [Mysqlx\_notice\_warning\_sent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_notice_warning_sent) | Integer | Both |
| [Mysqlx\_notified\_by\_group\_replication](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_notified_by_group_replication) | Integer | Both |
| [Mysqlx\_port](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_port) | String | Global |
| [Mysqlx\_prep\_deallocate](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_prep_deallocate) | Integer | Both |
| [Mysqlx\_prep\_execute](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_prep_execute) | Integer | Both |
| [Mysqlx\_prep\_prepare](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_prep_prepare) | Integer | Both |
| [Mysqlx\_rows\_sent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_rows_sent) | Integer | Both |
| [Mysqlx\_sessions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions) | Integer | Global |
| [Mysqlx\_sessions\_accepted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_accepted) | Integer | Global |
| [Mysqlx\_sessions\_closed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_closed) | Integer | Global |
| [Mysqlx\_sessions\_fatal\_error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_fatal_error) | Integer | Global |
| [Mysqlx\_sessions\_killed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_killed) | Integer | Global |
| [Mysqlx\_sessions\_rejected](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_sessions_rejected) | Integer | Global |
| [Mysqlx\_socket](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_socket) | String | Global |
| [Mysqlx\_ssl\_accept\_renegotiates](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_accept_renegotiates) | Integer | Global |
| [Mysqlx\_ssl\_accepts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_accepts) | Integer | Global |
| [Mysqlx\_ssl\_active](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_active) | Integer | Both |
| [Mysqlx\_ssl\_cipher](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_cipher) | Integer | Both |
| [Mysqlx\_ssl\_cipher\_list](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_cipher_list) | Integer | Both |
| [Mysqlx\_ssl\_ctx\_verify\_depth](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_ctx_verify_depth) | Integer | Both |
| [Mysqlx\_ssl\_ctx\_verify\_mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_ctx_verify_mode) | Integer | Both |
| [Mysqlx\_ssl\_finished\_accepts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_finished_accepts) | Integer | Global |
| [Mysqlx\_ssl\_server\_not\_after](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_server_not_after) | Integer | Global |
| [Mysqlx\_ssl\_server\_not\_before](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_server_not_before) | Integer | Global |
| [Mysqlx\_ssl\_verify\_depth](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_verify_depth) | Integer | Global |
| [Mysqlx\_ssl\_verify\_mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_verify_mode) | Integer | Global |
| [Mysqlx\_ssl\_version](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_ssl_version) | Integer | Both |
| [Mysqlx\_stmt\_create\_collection](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_create_collection) | Integer | Both |
| [Mysqlx\_stmt\_create\_collection\_index](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_create_collection_index) | Integer | Both |
| [Mysqlx\_stmt\_disable\_notices](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_disable_notices) | Integer | Both |
| [Mysqlx\_stmt\_drop\_collection](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_drop_collection) | Integer | Both |
| [Mysqlx\_stmt\_drop\_collection\_index](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_drop_collection_index) | Integer | Both |
| [Mysqlx\_stmt\_enable\_notices](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_enable_notices) | Integer | Both |
| [Mysqlx\_stmt\_ensure\_collection](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_ensure_collection) | String | Both |
| [Mysqlx\_stmt\_execute\_mysqlx](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_execute_mysqlx) | Integer | Both |
| [Mysqlx\_stmt\_execute\_sql](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_execute_sql) | Integer | Both |
| [Mysqlx\_stmt\_execute\_xplugin](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_execute_xplugin) | Integer | Both |
| [Mysqlx\_stmt\_get\_collection\_options](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_get_collection_options) | Integer | Both |
| [Mysqlx\_stmt\_kill\_client](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_kill_client) | Integer | Both |
| [Mysqlx\_stmt\_list\_clients](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_list_clients) | Integer | Both |
| [Mysqlx\_stmt\_list\_notices](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_list_notices) | Integer | Both |
| [Mysqlx\_stmt\_list\_objects](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_list_objects) | Integer | Both |
| [Mysqlx\_stmt\_modify\_collection\_options](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_modify_collection_options) | Integer | Both |
| [Mysqlx\_stmt\_ping](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_stmt_ping) | Integer | Both |
| [Mysqlx\_worker\_threads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_worker_threads) | Integer | Global |
| [Mysqlx\_worker\_threads\_active](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#statvar_Mysqlx_worker_threads_active) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_deferred\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_deferred_count) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_deferred\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_deferred_count_replica) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_deferred\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_deferred_count_session) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_deferred\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_deferred_count_slave) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_forced\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_forced_count) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_forced\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_forced_count_replica) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_forced\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_forced_count_session) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_forced\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_forced_count_slave) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_unforced\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_unforced_count) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_unforced\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_unforced_count_replica) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_unforced\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_unforced_count_session) | Integer | Global |
| [Ndb\_api\_adaptive\_send\_unforced\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_adaptive_send_unforced_count_slave) | Integer | Global |
| [Ndb\_api\_bytes\_received\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_received_count) | Integer | Global |
| [Ndb\_api\_bytes\_received\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_received_count_replica) | Integer | Global |
| [Ndb\_api\_bytes\_received\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_received_count_session) | Integer | Session |
| [Ndb\_api\_bytes\_received\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_received_count_slave) | Integer | Global |
| [Ndb\_api\_bytes\_sent\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_sent_count) | Integer | Global |
| [Ndb\_api\_bytes\_sent\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_sent_count_replica) | Integer | Global |
| [Ndb\_api\_bytes\_sent\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_sent_count_session) | Integer | Session |
| [Ndb\_api\_bytes\_sent\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_bytes_sent_count_slave) | Integer | Global |
| [Ndb\_api\_event\_bytes\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_bytes_count) | Integer | Global |
| [Ndb\_api\_event\_bytes\_count\_injector](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_bytes_count_injector) | Integer | Global |
| [Ndb\_api\_event\_data\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_data_count) | Integer | Global |
| [Ndb\_api\_event\_data\_count\_injector](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_data_count_injector) | Integer | Global |
| [Ndb\_api\_event\_nondata\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_nondata_count) | Integer | Global |
| [Ndb\_api\_event\_nondata\_count\_injector](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_event_nondata_count_injector) | Integer | Global |
| [Ndb\_api\_pk\_op\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pk_op_count) | Integer | Global |
| [Ndb\_api\_pk\_op\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pk_op_count_replica) | Integer | Global |
| [Ndb\_api\_pk\_op\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pk_op_count_session) | Integer | Session |
| [Ndb\_api\_pk\_op\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pk_op_count_slave) | Integer | Global |
| [Ndb\_api\_pruned\_scan\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pruned_scan_count) | Integer | Global |
| [Ndb\_api\_pruned\_scan\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pruned_scan_count_replica) | Integer | Global |
| [Ndb\_api\_pruned\_scan\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pruned_scan_count_session) | Integer | Session |
| [Ndb\_api\_pruned\_scan\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_pruned_scan_count_slave) | Integer | Global |
| [Ndb\_api\_range\_scan\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_range_scan_count) | Integer | Global |
| [Ndb\_api\_range\_scan\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_range_scan_count_replica) | Integer | Global |
| [Ndb\_api\_range\_scan\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_range_scan_count_session) | Integer | Session |
| [Ndb\_api\_range\_scan\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_range_scan_count_slave) | Integer | Global |
| [Ndb\_api\_read\_row\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_read_row_count) | Integer | Global |
| [Ndb\_api\_read\_row\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_read_row_count_replica) | Integer | Global |
| [Ndb\_api\_read\_row\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_read_row_count_session) | Integer | Session |
| [Ndb\_api\_read\_row\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_read_row_count_slave) | Integer | Global |
| [Ndb\_api\_scan\_batch\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_scan_batch_count) | Integer | Global |
| [Ndb\_api\_scan\_batch\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_scan_batch_count_replica) | Integer | Global |
| [Ndb\_api\_scan\_batch\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_scan_batch_count_session) | Integer | Session |
| [Ndb\_api\_scan\_batch\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_scan_batch_count_slave) | Integer | Global |
| [Ndb\_api\_table\_scan\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_table_scan_count) | Integer | Global |
| [Ndb\_api\_table\_scan\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_table_scan_count_replica) | Integer | Global |
| [Ndb\_api\_table\_scan\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_table_scan_count_session) | Integer | Session |
| [Ndb\_api\_table\_scan\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_table_scan_count_slave) | Integer | Global |
| [Ndb\_api\_trans\_abort\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_abort_count) | Integer | Global |
| [Ndb\_api\_trans\_abort\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_abort_count_replica) | Integer | Global |
| [Ndb\_api\_trans\_abort\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_abort_count_session) | Integer | Session |
| [Ndb\_api\_trans\_abort\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_abort_count_slave) | Integer | Global |
| [Ndb\_api\_trans\_close\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_close_count) | Integer | Global |
| [Ndb\_api\_trans\_close\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_close_count_replica) | Integer | Global |
| [Ndb\_api\_trans\_close\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_close_count_session) | Integer | Session |
| [Ndb\_api\_trans\_close\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_close_count_slave) | Integer | Global |
| [Ndb\_api\_trans\_commit\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_commit_count) | Integer | Global |
| [Ndb\_api\_trans\_commit\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_commit_count_replica) | Integer | Global |
| [Ndb\_api\_trans\_commit\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_commit_count_session) | Integer | Session |
| [Ndb\_api\_trans\_commit\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_commit_count_slave) | Integer | Global |
| [Ndb\_api\_trans\_local\_read\_row\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_local_read_row_count) | Integer | Global |
| [Ndb\_api\_trans\_local\_read\_row\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_local_read_row_count_replica) | Integer | Global |
| [Ndb\_api\_trans\_local\_read\_row\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_local_read_row_count_session) | Integer | Session |
| [Ndb\_api\_trans\_local\_read\_row\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_local_read_row_count_slave) | Integer | Global |
| [Ndb\_api\_trans\_start\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_start_count) | Integer | Global |
| [Ndb\_api\_trans\_start\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_start_count_replica) | Integer | Global |
| [Ndb\_api\_trans\_start\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_start_count_session) | Integer | Session |
| [Ndb\_api\_trans\_start\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_trans_start_count_slave) | Integer | Global |
| [Ndb\_api\_uk\_op\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_uk_op_count) | Integer | Global |
| [Ndb\_api\_uk\_op\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_uk_op_count_replica) | Integer | Global |
| [Ndb\_api\_uk\_op\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_uk_op_count_session) | Integer | Session |
| [Ndb\_api\_uk\_op\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_uk_op_count_slave) | Integer | Global |
| [Ndb\_api\_wait\_exec\_complete\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_exec_complete_count) | Integer | Global |
| [Ndb\_api\_wait\_exec\_complete\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_exec_complete_count_replica) | Integer | Global |
| [Ndb\_api\_wait\_exec\_complete\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_exec_complete_count_session) | Integer | Session |
| [Ndb\_api\_wait\_exec\_complete\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_exec_complete_count_slave) | Integer | Global |
| [Ndb\_api\_wait\_meta\_request\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_meta_request_count) | Integer | Global |
| [Ndb\_api\_wait\_meta\_request\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_meta_request_count_replica) | Integer | Global |
| [Ndb\_api\_wait\_meta\_request\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_meta_request_count_session) | Integer | Session |
| [Ndb\_api\_wait\_meta\_request\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_meta_request_count_slave) | Integer | Global |
| [Ndb\_api\_wait\_nanos\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_nanos_count) | Integer | Global |
| [Ndb\_api\_wait\_nanos\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_nanos_count_replica) | Integer | Global |
| [Ndb\_api\_wait\_nanos\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_nanos_count_session) | Integer | Session |
| [Ndb\_api\_wait\_nanos\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_nanos_count_slave) | Integer | Global |
| [Ndb\_api\_wait\_scan\_result\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_scan_result_count) | Integer | Global |
| [Ndb\_api\_wait\_scan\_result\_count\_replica](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_scan_result_count_replica) | Integer | Global |
| [Ndb\_api\_wait\_scan\_result\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_scan_result_count_session) | Integer | Session |
| [Ndb\_api\_wait\_scan\_result\_count\_slave](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_api_wait_scan_result_count_slave) | Integer | Global |
| [Ndb\_cluster\_node\_id](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_cluster_node_id) | Integer | Global |
| [Ndb\_config\_from\_host](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_config_from_host) | Integer | Both |
| [Ndb\_config\_from\_port](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_config_from_port) | Integer | Both |
| [Ndb\_config\_generation](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_config_generation) | Integer | Global |
| [Ndb\_conflict\_fn\_epoch](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_epoch) | Integer | Global |
| [Ndb\_conflict\_fn\_epoch\_trans](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_epoch_trans) | Integer | Global |
| [Ndb\_conflict\_fn\_epoch2](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_epoch2) | Integer | Global |
| [Ndb\_conflict\_fn\_epoch2\_trans](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_epoch2_trans) | Integer | Global |
| [Ndb\_conflict\_fn\_max](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_max) | Integer | Global |
| [Ndb\_conflict\_fn\_old](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_fn_old) | Integer | Global |
| [Ndb\_conflict\_last\_stable\_epoch](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_last_stable_epoch) | Integer | Global |
| [Ndb\_conflict\_reflected\_op\_discard\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_reflected_op_discard_count) | Integer | Global |
| [Ndb\_conflict\_reflected\_op\_prepare\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_reflected_op_prepare_count) | Integer | Global |
| [Ndb\_conflict\_refresh\_op\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_refresh_op_count) | Integer | Global |
| [Ndb\_conflict\_trans\_conflict\_commit\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_conflict_commit_count) | Integer | Global |
| [Ndb\_conflict\_trans\_detect\_iter\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_detect_iter_count) | Integer | Global |
| [Ndb\_conflict\_trans\_reject\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_reject_count) | Integer | Global |
| [Ndb\_conflict\_trans\_row\_conflict\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_row_conflict_count) | Integer | Global |
| [Ndb\_conflict\_trans\_row\_reject\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_conflict_trans_row_reject_count) | Integer | Global |
| [Ndb\_epoch\_delete\_delete\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_epoch_delete_delete_count) | Integer | Global |
| [Ndb\_execute\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_execute_count) | Integer | Global |
| [Ndb\_last\_commit\_epoch\_server](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_last_commit_epoch_server) | Integer | Global |
| [Ndb\_last\_commit\_epoch\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_last_commit_epoch_session) | Integer | Session |
| [Ndb\_metadata\_blacklist\_size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_metadata_excluded_count) | Integer | Global |
| [Ndb\_metadata\_detected\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_metadata_detected_count) | Integer | Global |
| [Ndb\_metadata\_excluded\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_metadata_excluded_count) | Integer | Global |
| [Ndb\_metadata\_synced\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_metadata_synced_count) | Integer | Global |
| [Ndb\_cluster\_node\_id](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_cluster_node_id) | Integer | Global |
| [Ndb\_number\_of\_data\_nodes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_number_of_data_nodes) | Integer | Global |
| [Ndb\_pruned\_scan\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pruned_scan_count) | Integer | Global |
| [Ndb\_pushed\_queries\_defined](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pushed_queries_defined) | Integer | Global |
| [Ndb\_pushed\_queries\_dropped](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pushed_queries_dropped) | Integer | Global |
| [Ndb\_pushed\_queries\_executed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pushed_queries_executed) | Integer | Global |
| [Ndb\_pushed\_reads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_pushed_reads) | Integer | Global |
| [Ndb\_scan\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_scan_count) | Integer | Global |
| [Ndb\_trans\_hint\_count\_session](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#statvar_Ndb_trans_hint_count_session) | Integer | Both |
| [Not\_flushed\_delayed\_rows](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Not_flushed_delayed_rows) | Integer | Global |
| [Ongoing\_anonymous\_gtid\_violating\_transaction\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ongoing_anonymous_gtid_violating_transaction_count) | Integer | Global |
| [Ongoing\_anonymous\_transaction\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ongoing_anonymous_transaction_count) | Integer | Global |
| [Ongoing\_automatic\_gtid\_violating\_transaction\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ongoing_automatic_gtid_violating_transaction_count) | Integer | Global |
| [Open\_files](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Open_files) | Integer | Global |
| [Open\_streams](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Open_streams) | Integer | Global |
| [Open\_table\_definitions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Open_table_definitions) | Integer | Global |
| [Open\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Open_tables) | Integer | Both |
| [Opened\_files](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Opened_files) | Integer | Global |
| [Opened\_table\_definitions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Opened_table_definitions) | Integer | Both |
| [Opened\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Opened_tables) | Integer | Both |
| [Performance\_schema\_accounts\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_accounts_lost) | Integer | Global |
| [Performance\_schema\_cond\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_cond_classes_lost) | Integer | Global |
| [Performance\_schema\_cond\_instances\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_cond_instances_lost) | Integer | Global |
| [Performance\_schema\_digest\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_digest_lost) | Integer | Global |
| [Performance\_schema\_file\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_file_classes_lost) | Integer | Global |
| [Performance\_schema\_file\_handles\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_file_handles_lost) | Integer | Global |
| [Performance\_schema\_file\_instances\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_file_instances_lost) | Integer | Global |
| [Performance\_schema\_hosts\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_hosts_lost) | Integer | Global |
| [Performance\_schema\_index\_stat\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_index_stat_lost) | Integer | Global |
| [Performance\_schema\_locker\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_locker_lost) | Integer | Global |
| [Performance\_schema\_memory\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_memory_classes_lost) | Integer | Global |
| [Performance\_schema\_metadata\_lock\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_metadata_lock_lost) | Integer | Global |
| [Performance\_schema\_mutex\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_mutex_classes_lost) | Integer | Global |
| [Performance\_schema\_mutex\_instances\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_mutex_instances_lost) | Integer | Global |
| [Performance\_schema\_nested\_statement\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_nested_statement_lost) | Integer | Global |
| [Performance\_schema\_prepared\_statements\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_prepared_statements_lost) | Integer | Global |
| [Performance\_schema\_program\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_program_lost) | Integer | Global |
| [Performance\_schema\_rwlock\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_rwlock_classes_lost) | Integer | Global |
| [Performance\_schema\_rwlock\_instances\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_rwlock_instances_lost) | Integer | Global |
| [Performance\_schema\_session\_connect\_attrs\_longest\_seen](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_session_connect_attrs_longest_seen) | Integer | Global |
| [Performance\_schema\_session\_connect\_attrs\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_session_connect_attrs_lost) | Integer | Global |
| [Performance\_schema\_socket\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_socket_classes_lost) | Integer | Global |
| [Performance\_schema\_socket\_instances\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_socket_instances_lost) | Integer | Global |
| [Performance\_schema\_stage\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_stage_classes_lost) | Integer | Global |
| [Performance\_schema\_statement\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_statement_classes_lost) | Integer | Global |
| [Performance\_schema\_table\_handles\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_table_handles_lost) | Integer | Global |
| [Performance\_schema\_table\_instances\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_table_instances_lost) | Integer | Global |
| [Performance\_schema\_table\_lock\_stat\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_table_lock_stat_lost) | Integer | Global |
| [Performance\_schema\_thread\_classes\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_thread_classes_lost) | Integer | Global |
| [Performance\_schema\_thread\_instances\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_thread_instances_lost) | Integer | Global |
| [Performance\_schema\_users\_lost](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#statvar_Performance_schema_users_lost) | Integer | Global |
| [Prepared\_stmt\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Prepared_stmt_count) | Integer | Global |
| [Queries](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Queries) | Integer | Both |
| [Questions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Questions) | Integer | Both |
| [Rewriter\_number\_loaded\_rules](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rewriter_number_loaded_rules) | Integer | Global |
| [Rewriter\_number\_reloads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rewriter_number_reloads) | Integer | Global |
| [Rewriter\_number\_rewritten\_queries](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rewriter_number_rewritten_queries) | Integer | Global |
| [Rewriter\_reload\_error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rewriter_reload_error) | Boolean | Global |
| [Rpl\_semi\_sync\_master\_clients](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_clients) | Integer | Global |
| [Rpl\_semi\_sync\_master\_net\_avg\_wait\_time](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_net_avg_wait_time) | Integer | Global |
| [Rpl\_semi\_sync\_master\_net\_wait\_time](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_net_wait_time) | Integer | Global |
| [Rpl\_semi\_sync\_master\_net\_waits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_net_waits) | Integer | Global |
| [Rpl\_semi\_sync\_master\_no\_times](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_no_times) | Integer | Global |
| [Rpl\_semi\_sync\_master\_no\_tx](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_no_tx) | Integer | Global |
| [Rpl\_semi\_sync\_master\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_status) | Boolean | Global |
| [Rpl\_semi\_sync\_master\_timefunc\_failures](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_timefunc_failures) | Integer | Global |
| [Rpl\_semi\_sync\_master\_tx\_avg\_wait\_time](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_tx_avg_wait_time) | Integer | Global |
| [Rpl\_semi\_sync\_master\_tx\_wait\_time](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_tx_wait_time) | Integer | Global |
| [Rpl\_semi\_sync\_master\_tx\_waits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_tx_waits) | Integer | Global |
| [Rpl\_semi\_sync\_master\_wait\_pos\_backtraverse](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_wait_pos_backtraverse) | Integer | Global |
| [Rpl\_semi\_sync\_master\_wait\_sessions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_wait_sessions) | Integer | Global |
| [Rpl\_semi\_sync\_master\_yes\_tx](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_master_yes_tx) | Integer | Global |
| [Rpl\_semi\_sync\_slave\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rpl_semi_sync_slave_status) | Boolean | Global |
| [Rsa\_public\_key](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Rsa_public_key) | String | Global |
| [Secondary\_engine\_execution\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Secondary_engine_execution_count) | Integer | Both |
| [Select\_full\_join](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_full_join) | Integer | Both |
| [Select\_full\_range\_join](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_full_range_join) | Integer | Both |
| [Select\_range](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_range) | Integer | Both |
| [Select\_range\_check](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_range_check) | Integer | Both |
| [Select\_scan](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Select_scan) | Integer | Both |
| [Slave\_open\_temp\_tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Slave_open_temp_tables) | Integer | Global |
| [Slave\_rows\_last\_search\_algorithm\_used](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Slave_rows_last_search_algorithm_used) | String | Global |
| [Slow\_launch\_threads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Slow_launch_threads) | Integer | Both |
| [Slow\_queries](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Slow_queries) | Integer | Both |
| [Sort\_merge\_passes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Sort_merge_passes) | Integer | Both |
| [Sort\_range](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Sort_range) | Integer | Both |
| [Sort\_rows](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Sort_rows) | Integer | Both |
| [Sort\_scan](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Sort_scan) | Integer | Both |
| [Ssl\_accept\_renegotiates](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_accept_renegotiates) | Integer | Global |
| [Ssl\_accepts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_accepts) | Integer | Global |
| [Ssl\_callback\_cache\_hits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_callback_cache_hits) | Integer | Global |
| [Ssl\_cipher](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_cipher) | String | Both |
| [Ssl\_cipher\_list](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_cipher_list) | String | Both |
| [Ssl\_client\_connects](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_client_connects) | Integer | Global |
| [Ssl\_connect\_renegotiates](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_connect_renegotiates) | Integer | Global |
| [Ssl\_ctx\_verify\_depth](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_ctx_verify_depth) | Integer | Global |
| [Ssl\_ctx\_verify\_mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_ctx_verify_mode) | Integer | Global |
| [Ssl\_default\_timeout](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_default_timeout) | Integer | Both |
| [Ssl\_finished\_accepts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_finished_accepts) | Integer | Global |
| [Ssl\_finished\_connects](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_finished_connects) | Integer | Global |
| [Ssl\_server\_not\_after](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_server_not_after) | Integer | Both |
| [Ssl\_server\_not\_before](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_server_not_before) | Integer | Both |
| [Ssl\_session\_cache\_hits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_hits) | Integer | Global |
| [Ssl\_session\_cache\_misses](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_misses) | Integer | Global |
| [Ssl\_session\_cache\_mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_mode) | String | Global |
| [Ssl\_session\_cache\_overflows](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_overflows) | Integer | Global |
| [Ssl\_session\_cache\_size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_size) | Integer | Global |
| [Ssl\_session\_cache\_timeouts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_session_cache_timeouts) | Integer | Global |
| [Ssl\_sessions\_reused](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_sessions_reused) | Integer | Both |
| [Ssl\_used\_session\_cache\_entries](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_used_session_cache_entries) | Integer | Global |
| [Ssl\_verify\_depth](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_verify_depth) | Integer | Both |
| [Ssl\_verify\_mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_verify_mode) | Integer | Both |
| [Ssl\_version](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Ssl_version) | String | Both |
| [Table\_locks\_immediate](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_locks_immediate) | Integer | Global |
| [Table\_locks\_waited](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_locks_waited) | Integer | Global |
| [Table\_open\_cache\_hits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_open_cache_hits) | Integer | Both |
| [Table\_open\_cache\_misses](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_open_cache_misses) | Integer | Both |
| [Table\_open\_cache\_overflows](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Table_open_cache_overflows) | Integer | Both |
| [Tc\_log\_max\_pages\_used](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Tc_log_max_pages_used) | Integer | Global |
| [Tc\_log\_page\_size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Tc_log_page_size) | Integer | Global |
| [Tc\_log\_page\_waits](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Tc_log_page_waits) | Integer | Global |
| [Threads\_cached](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Threads_cached) | Integer | Global |
| [Threads\_connected](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Threads_connected) | Integer | Global |
| [Threads\_created](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Threads_created) | Integer | Global |
| [Threads\_running](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Threads_running) | Integer | Global |
| [Uptime](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Uptime) | Integer | Global |
| [Uptime\_since\_flush\_status](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Uptime_since_flush_status) | Integer | Global |
| [validate\_password\_dictionary\_file\_last\_parsed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_validate_password_dictionary_file_last_parsed) | Datetime | Global |
| [validate\_password\_dictionary\_file\_words\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_validate_password_dictionary_file_words_count) | Integer | Global |
| [validate\_password.dictionary\_file\_last\_parsed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_validate_password.dictionary_file_last_parsed) | Datetime | Global |
| [validate\_password.dictionary\_file\_words\_count](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#statvar_validate_password.dictionary_file_words_count) | Integer | Global |

### 5.1.7 服务端命令参考项

当你启动mysqld服务器时，你可以使用4.2.2节 "指定程序选项 "中描述的任何方法来指定程序选项。最常见的方法是在选项文件中或在命令行中提供选项。然而，在大多数情况下，最好是确保服务器每次运行都使用相同的选项。确保这一点的最好方法是在选项文件中列出它们。参见第4.2.2.2节，"使用选项文件"。该节还描述了选项文件的格式和语法。

mysqld从[mysqld]和[server]组读取选项。mysqld\_safe从[mysqld]、[server]、[mysqld\_safe]和[safe\_mysqld]组读取选项。mysql.server从[mysqld]和[mysql.server]组读取选项。

mysqld接受许多命令选项。对于一个简短的总结，执行这个命令。

mysqld --help

To see the full list, use this command:

mysqld --verbose --help

列表中的一些项目实际上是系统变量，可以在服务器启动时设置。这些可以在运行时使用SHOW VARIABLES语句显示。前面的mysqld命令显示的一些项目不会出现在SHOW VARIABLES输出中；这是因为它们只是选项而不是系统变量。

下面的列表显示了一些最常见的服务器选项。其他选项在其他章节中描述。

- 影响安全的选项。参见第6.1.4节，"与安全相关的mysqld选项和变量"。

- 与SSL相关的选项。见加密连接的命令选项。

- 二进制日志控制选项。见第5.4.4节 "二进制日志"。

- 复制相关选项。见第17.1.6节，"复制和二进制日志选项和变量"。

- 加载插件的选项，如可插拔的存储引擎。见第5.6.1节，"安装和卸载插件"。

- 针对特定存储引擎的选项。参见第15.14节，"InnoDB启动选项和系统变量 "和第16.2.1节，"MyISAM启动选项"。

一些选项控制缓冲区或缓存的大小。对于一个给定的缓冲区，服务器可能需要分配内部数据结构。这些结构通常是从分配给缓冲区的总内存中分配的，所需空间的大小可能与平台有关。这意味着，当你给控制缓冲区大小的选项赋值时，实际可用的空间量可能与赋值不同。在某些情况下，该数量可能少于分配的值。也有可能服务器会向上调整一个值。例如，如果你给一个最小值为1024的选项分配了一个0的值，服务器就会把这个值设置为1024。

除非另有规定，缓冲区大小、长度和堆栈大小的值都是以字节为单位的。

一些选项采用文件名值。除非另有说明，如果该值是一个相对路径名，默认的文件位置是数据目录。要明确指定位置，请使用绝对路径名。假设数据目录是/var/mysql/data。如果一个文件值选项被赋予相对路径名，那么它就位于/var/mysql/data下。如果该值是一个绝对路径名，它的位置就像路径名所给的那样。

你也可以在服务器启动时通过使用变量名作为选项来设置服务器系统变量的值。要为一个服务器系统变量赋值，请使用 --var\_name=value 的选项。例如，--sort\_buffer\_size=384M将sort\_buffer\_size变量设置为384MB的值。

当你给一个变量赋值时，MySQL可能会自动纠正该值以保持在一个给定的范围内，或者如果只允许某些值，则将该值调整为最接近的允许值。

要限制系统变量在运行时可以用SET语句设置的最大值，可以在服务器启动时使用--maximum-var\_name=value形式的选项来指定这个最大值。

你可以在运行时用SET语句改变大多数系统变量的值。参见第13.7.6.1节，"变量赋值的SET语法"。

第5.1.8节 "服务器系统变量 "提供了对所有变量的完整描述，以及在服务器启动和运行时设置它们的附加信息。关于改变系统变量的信息，请参见第5.1.1节 "配置服务器"。

* [--help](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_help), -?

|  |  |
| --- | --- |
| **Command-Line Format** | **--help** |

* - 显示一个简短的帮助信息并退出。同时使用--verbose和--help选项可以看到完整的信息。
* [--admin-ssl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_admin-ssl), [--skip-admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl)

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-ssl[={OFF|ON}]** |
| **Introduced** | 8.0.21 |
| **Deprecated** | 8.0.26 |
| **Type** | Boolean |
| **Default Value** | **ON** |

* --admin-ssl选项和--ssl选项一样，只是它适用于管理连接接口而不是主连接接口。关于这些接口的信息，见第5.1.12.1节，"连接接口"。
* --admin-ssl选项指定服务器允许但不要求在管理接口上进行加密连接。这个选项在默认情况下是启用的。
* --admin-ssl可以以否定的形式指定为--skip-admin-ssl或一个同义词（--admin-ssl=OFF，--disable-admin-ssl）。在这种情况下，该选项指定服务器不允许加密连接，无论admin\_tsl\_xxx和admin\_ssl\_xxx系统变量的设置如何。
* --admin-ssl选项只在服务器启动时对管理界面是否支持加密连接产生影响。它被忽略，对ALTER INSTANCE RELOAD TLS在运行时的操作没有影响。例如，你可以使用 --admin-ssl=OFF 在禁用加密连接的情况下启动管理界面，然后重新配置TLS并执行ALTER INSTANCE RELOAD TLS FOR CHANNEL mysql\_admin，以便在运行时启用加密连接。
* - 关于配置连接加密支持的一般信息，见第6.3.1节，"配置MySQL使用加密连接"。该讨论是为主连接界面编写的，但参数名称对管理连接界面来说是类似的。考虑至少在服务器端设置admin\_ssl\_cert和admin\_ssl\_key系统变量，在客户端设置--ssl-ca（或--ssl-capath）选项。有关专门针对管理界面的其他信息，请参见管理界面对加密连接的支持。
* - 由于对加密连接的支持是默认启用的，因此通常不需要指定--admin-ssl。从MySQL 8.0.26开始，--admin-ssl已被废弃，并将在未来的MySQL版本中删除。如果希望禁用加密连接，可以不以否定的形式指定--admin-ssl。将admin\_tls\_version系统变量设置为空值，表示不支持TLS版本。例如，服务器my.cnf文件中的这几行是禁用加密连接的。
* [mysqld]
* admin\_tls\_version=''

* [--allow-suspicious-udfs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_allow-suspicious-udfs)

|  |  |
| --- | --- |
| **Command-Line Format** | **--allow-suspicious-udfs[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* - 这个选项控制只有一个xxx符号的主函数的可加载函数是否可以被加载。默认情况下，该选项是关闭的，只有至少有一个辅助符号的可加载函数可以被加载；这可以防止试图从共享对象文件加载函数，而不是包含合法函数的文件。参见可加载函数安全注意事项。
* [--ansi](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_ansi)

|  |  |
| --- | --- |
| **Command-Line Format** | **--ansi** |

* - 使用标准（ANSI）SQL语法而不是MySQL语法。要想更精确地控制服务器SQL模式，可使用-sql-mode选项来代替。见第1.7节 "MySQL标准的遵守 "和第5.1.11节 "服务器SQL模式"。
* [--basedir=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_basedir)***[dir\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_basedir)***, [-b ***dir\_name***](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_basedir)

|  |  |
| --- | --- |
| **Command-Line Format** | **--basedir=dir\_name** |
| **System Variable** | [**basedir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_basedir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **parent of mysqld installation directory** |

* 到MySQL安装目录的路径。该选项设置了basedir系统变量。
* - 服务器可执行文件在启动时确定它自己的全路径名称，并使用它所在目录的父目录作为默认的baseir值。这反过来又使服务器在搜索与服务器有关的信息（如包含错误信息的共享目录）时使用该basedir。
* [--character-set-client-handshake](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_character-set-client-handshake)

|  |  |
| --- | --- |
| **Command-Line Format** | **--character-set-client-handshake[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **ON** |

* 不要忽略客户端发送的字符集信息。要忽略客户端信息并使用默认的服务器字符集，请使用 --skip-character-set-client-handshake；这使MySQL的行为与MySQL 4.0类似。
* [--chroot=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_chroot)***[dir\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_chroot)***, -r ***dir\_name***

|  |  |
| --- | --- |
| **Command-Line Format** | **--chroot=dir\_name** |
| **Type** | Directory name |

* - 通过使用chroot()系统调用，在启动期间将mysqld服务器置于一个封闭的环境。这是一个推荐的安全措施。使用这个选项在一定程度上限制了LOAD DATA和SELECT ... INTO OUTFILE。
* [--console](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_console)

|  |  |
| --- | --- |
| **Command-Line Format** | **--console** |
| **Platform Specific** | Windows |

* - (仅适用于Windows。)导致默认的错误日志目的地为控制台。这影响到以默认目标为基础的日志汇，它们自己的输出目标是基于默认目标的。参见第5.4.2节 "错误日志"。如果使用这个选项，mysqld不会关闭控制台窗口。
* - 如果同时给出--console，则优先于--log-error。
* --core-file

|  |  |
| --- | --- |
| **Command-Line Format** | **--core-file[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 如果mysqld死亡，写一个核心文件。核心文件的名称和位置取决于系统。在Linux上，一个名为core.pid的核心文件被写入进程的当前工作目录，对于mysqld来说，它是数据目录。在macOS上，一个名为core.pid的核心文件被写入到/cores目录。在Solaris上，使用coreadm命令指定写入核心文件的位置以及如何命名它。

- 对于某些系统，要获得一个核心文件，你还必须向mysqld\_safe指定--核心文件大小选项。见第4.3.2节，"mysqld\_safe--MySQL服务器启动脚本"。在某些系统上，例如Solaris，如果你同时使用--user选项，你就不会得到一个核心文件。可能有额外的限制或约束。例如，在启动服务器之前，可能需要执行ulimit -c unlimited。请查阅你的系统文档。

* - innodb\_buffer\_pool\_in\_core\_file变量可以用来在支持它的操作系统上减少核心文件的大小。更多信息，请参见第15.8.3.7节，"从核心文件中排除缓冲池页面"
* [--daemonize](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_daemonize), -D

|  |  |
| --- | --- |
| **Command-Line Format** | **--daemonize[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 该选项使服务器作为一个传统的、分叉的守护进程运行，允许它与使用systemd进行进程控制的操作系统一起工作。更多信息请参见第2.5.9节 "用systemd管理MySQL服务器"。

--daemonize与-initialize和-initialize-insecure相互排斥。

- 如果服务器使用 --daemonize 选项启动，并且没有连接到 tty 设备上，在没有明确的日志选项的情况下，会使用默认的错误日志选项 --log-error="" ，将错误输出指向默认的日志文件。

* -D是--daemonize的同义词。
* [--datadir=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_datadir)***[dir\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_datadir)***, -h ***dir\_name***

|  |  |
| --- | --- |
| **Command-Line Format** | **--datadir=dir\_name** |
| **System Variable** | [**datadir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_datadir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |

* - 通往MySQL服务器数据目录的路径。该选项设置了datadir系统变量。参见该变量的描述。
* [--debug[=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_debug)***[debug\_options](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_debug)***[]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_debug), -# [***debug\_options***]

|  |  |
| --- | --- |
| **Command-Line Format** | **--debug[=debug\_options]** |
| **System Variable** | [**debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value (Unix)** | **d:t:i:o,/tmp/mysqld.trace** |
| **Default Value (Windows)** | **d:t:i:O,\mysqld.trace** |

- 如果MySQL是用-DWITH\_DEBUG=1 CMake选项配置的，你可以使用这个选项来获得mysqld正在做什么的跟踪文件。一个典型的debug\_options字符串是d:t:o,file\_name。在Unix上默认为d:t:i:o,/tmp/mysqld.trace，在Windows上为d:t:i:O,\mysqld.trace。

- 使用-DWITH\_DEBUG=1来配置具有调试支持的MySQL，可以使你在启动服务器时使用-debug="d,parser\_debug "选项。这将导致用于处理SQL语句的Bison解析器向服务器的标准错误输出转储一个解析器跟踪。通常情况下，这个输出被写到错误日志中。

- 这个选项可以多次给出。以 "+"或"-"开头的值是在前一个值的基础上加上或减去的。例如，--debug=T --debug=+P将值设为P:T。

* - 更多信息请参见第5.9.4节 "DBUG包"。
* [--debug-sync-timeout[=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_debug-sync-timeout)***[N](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_debug-sync-timeout)***[]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_debug-sync-timeout)

|  |  |
| --- | --- |
| **Command-Line Format** | **--debug-sync-timeout[=#]** |
| **Type** | Integer |

控制用于测试和调试的Debug Sync设施是否被启用。使用Debug Sync需要用-DENABLE\_DEBUG\_SYNC=1 CMake选项来配置MySQL（见2.9.7节，"MySQL源配置选项"）。如果Debug Sync没有被编译进去，这个选项就不可用。该选项的值是以秒为单位的超时。默认值是0，它禁用了Debug Sync。要启用它，请指定一个大于0的值；这个值也成为各个同步点的默认超时。如果该选项没有给出值，则超时时间被设置为300秒。

* - 关于Debug Sync设施的描述以及如何使用同步点，请参阅MySQL内部。测试同步。
* [--default-time-zone=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_default-time-zone)***[timezone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_default-time-zone)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--default-time-zone=name** |
| **Type** | String |

- 设置默认的服务器时区。这个选项设置了全局的time\_zone系统变量。如果没有给出这个选项，默认时区与系统时区相同（由system\_time\_zone系统变量的值给出。

--defaults-extra-file=file\_name

在全局选项文件之后，但（在Unix下）在用户选项文件之前读取这个选项文件。如果该文件不存在或者无法访问，会发生错误。如果file\_name不是一个绝对路径名，它将被解释为相对于当前目录。如果使用这个选项，它必须是命令行中的第一个选项。

关于这个选项和其他选项-文件选项的其他信息，见第4.2.2.3节 "影响选项-文件处理的命令行选项"。

--defaults-file=file\_name

只读取给定的选项文件。如果该文件不存在或者无法访问，会发生错误。如果file\_name不是一个绝对路径名，它将被解释为相对于当前目录。

异常情况。即使使用--defaults-file，mysqld也会读取mysqld-auto.cnf。

注意

如果使用这个选项，它必须是命令行上的第一个选项，但如果服务器是用--defaults-file和--install(或--install-manual)选项启动的，--install(或--install-manual)必须是第一个。

关于这个选项和其他选项文件的其他信息，请参见第4.2.2.3节，"影响选项文件处理的命令行选项"。

--defaults-group-suffix=str

不仅读取通常的选项组，而且还读取具有通常名称和str后缀的组。例如，mysqld通常读取的是[mysqld]组。如果该选项以--defaults-group-suffix=\_other的形式给出，mysqld也会读取[mysqld\_other]组。

* 关于这个选项和其他选项文件选项的其他信息，见第4.2.2.3节，"影响选项文件处理的命令行选项"。
* [--early-plugin-load=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_early-plugin-load)***[plugin\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_early-plugin-load)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--early-plugin-load=plugin\_list** |
| **Type** | String |
| **Default Value** | **empty string** |

- 这个选项告诉服务器在加载强制性的内置插件和存储引擎初始化之前要加载哪些插件。如果给出了多个 --early-plugin-load 选项，那么只有最后一个选项适用。

- 该选项的值是一个分号分隔的plugin\_library和name=plugin\_library值的列表。每个plugin\_library是一个包含插件代码的库文件的名称，每个name是要加载的插件的名称。如果一个插件库的名称中没有任何前面的插件名称，服务器就会加载库中的所有插件。如果有一个前面的插件名称，服务器就只从库中加载命名的插件。服务器会在plugin\_dir系统变量命名的目录中寻找插件库文件。

- 例如，如果名为myplug1和myplug2的插件包含在插件库文件myplug1.so和myplug2.so中，使用这个选项来执行早期插件加载。

- mysqld --early-plugin-load="myplug1=myplug1.so;myplug2=myplug2.so"

- 参数值周围有引号，因为否则一些命令解释器会将分号(;)解释为一个特殊字符。(例如，Unix shells把它当作一个命令终止符）。

- 每个命名的插件只为mysqld的一次调用提前加载。在重新启动后，除非再次使用--early-plugin-load，否则该插件不会被提前加载。

- 如果服务器使用--initialize或--initialize-insecure启动，由--early-plugin-load指定的插件不会被加载。

- 如果服务器以 --help 运行，那么 --early-plugin-load 所指定的插件会被加载，但不会被初始化。这种行为保证了插件选项在帮助信息中的显示。

- InnoDB表空间加密依赖于MySQL密钥环进行加密密钥管理，要使用的密钥环插件必须在存储引擎初始化之前加载，以方便InnoDB恢复加密的表。例如，希望在启动时加载keyring\_file插件的管理员应该使用--early-plugin-load，并加上适当的选项值（如Unix和类Unix系统上的keyring\_file.so或Windows上的keyring\_file.dll）。

- 关于InnoDB表空间加密的信息，参见第15.13节，"InnoDB静态数据加密"。关于加载插件的一般信息，参见第5.6.1节 "安装和卸载插件"。

- 注意

- 对于MySQL Keyring，该选项仅在钥匙库用钥匙圈插件管理时使用。如果钥匙库管理使用钥匙圈组件而不是插件，请使用清单文件指定组件的加载；见第6.4.4.2节，"钥匙圈组件的安装"。

* [--exit-info[=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_exit-info)***[flags](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_exit-info)***[]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_exit-info), -T [***flags***]

|  |  |
| --- | --- |
| **Command-Line Format** | **--exit-info[=flags]** |
| **Type** | Integer |

* - 这是一个不同标志的位掩码，你可以用来调试mysqld服务器。除非你知道它的确切作用，否则不要使用这个选项!
* [--external-locking](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_external-locking)

|  |  |
| --- | --- |
| **Command-Line Format** | **--external-locking[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 启用外部锁定（系统锁定），默认情况下是禁用的。如果你在lockd不完全工作的系统上使用这个选项（如Linux），mysqld很容易出现死锁。

- 要明确地禁用外部锁定，使用 --skip-external-lock。

* - 外部锁定只影响MyISAM表的访问。更多信息，包括可以和不能使用的条件，见第8.11.5节，"外部锁定"。
* [--flush](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_flush)

|  |  |
| --- | --- |
| **Command-Line Format** | **--flush[={OFF|ON}]** |
| **System Variable** | [**flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 在每条SQL语句之后，将所有的变化冲洗（同步）到磁盘。通常，MySQL仅在每个SQL语句之后将所有更改写入磁盘，并让操作系统处理同步到磁盘的工作。见B.3.3.3节，"如果MySQL一直崩溃该怎么办"。

- 注意

* - 如果指定了-flush，flush\_time的值并不重要，对flush\_time的改变对flush行为没有影响。
* [--gdb](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_gdb)

|  |  |
| --- | --- |
| **Command-Line Format** | **--gdb[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 安装SIGINT的中断处理程序（需要用^C停止mysqld以设置断点），并禁用堆栈跟踪和核心文件处理。参见5.9.1.4节 "在gdb下调试mysqld"。

- 在Windows上，该选项还抑制了用于实现RESTART语句的分叉。分叉使一个进程作为另一个进程的监视器，而另一个进程则作为服务器。然而，分叉使得确定要连接到哪个服务器进程进行调试变得更加困难，所以用--gdb启动服务器时，会抑制分叉。对于用这个选项启动的服务器，RESTART只是退出，并不重新启动。

* - 在非调试设置中，可以使用 --no-monitor 来抑制分叉监控进程。
* [--initialize](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_initialize), -I

|  |  |
| --- | --- |
| **Command-Line Format** | **--initialize[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 该选项用于通过创建数据目录和填充mysql系统模式中的表来初始化MySQL安装。更多信息，见第2.10.1节 "初始化数据目录"。

- 当服务器以-initialize启动时，一些功能不可用，这些功能限制了init\_file系统变量命名的任何文件中允许的语句。欲了解更多信息，请参见该变量的描述。此外，disabled\_storage\_engines系统变量也没有作用。

* - 当与-initialize一起使用时，--ndbcluster选项被忽略。
* [--initialize](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_initialize) is mutually exclusive with [--daemonize](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_daemonize).
* -I is a synonym for [--initialize](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_initialize).

* [--initialize-insecure](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_initialize-insecure)

|  |  |
| --- | --- |
| **Command-Line Format** | **--initialize-insecure[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 该选项用于通过创建数据目录和填充mysql系统模式中的表来初始化MySQL安装。这个选项意味着-initialize。更多信息，见该选项的描述，以及第2.10.1节 "初始化数据目录"。

--initialize-insecure与--daemonize是相互排斥的。

--innodb-xxx

* 为InnoDB存储引擎设置一个选项。InnoDB选项在第15.14节 "InnoDB启动选项和系统变量 "中列出。
* [--install [](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_install)***[service\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_install)***[]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_install)

|  |  |
| --- | --- |
| **Command-Line Format** | **--install [service\_name]** |
| **Platform Specific** | Windows |

* - (仅Windows) 将服务器安装为Windows服务，在Windows启动时自动启动。如果没有给出service\_name值，默认的服务名称是MySQL。欲了解更多信息，请参见第2.3.4.8节 "将MySQL作为Windows服务启动"。
* **Note**
* If the server is started with the [--defaults-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_defaults-file) and [--install](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_install) options, [--install](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_install) must be first.

* [--install-manual [](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_install-manual)***[service\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_install-manual)***[]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_install-manual)

|  |  |
| --- | --- |
| **Command-Line Format** | **--install-manual [service\_name]** |
| **Platform Specific** | Windows |

* - (仅Windows) 将服务器安装为一个必须手动启动的Windows服务。它不会在Windows启动时自动启动。如果没有给出service\_name值，默认的服务名称是MySQL。欲了解更多信息，请参见第2.3.4.8节 "将MySQL作为Windows服务启动"
* **Note**
* If the server is started with the [--defaults-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_defaults-file) and [--install-manual](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_install-manual) options, [--install-manual](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_install-manual) must be first.

* [--language=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_language)***[lang\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_language)***[, -L](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_language)***[lang\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_language)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--language=name** |
| **Deprecated** | Yes; use [**lc-messages-dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_lc-messages-dir) instead |
| **System Variable** | **language** |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **/usr/local/mysql/share/mysql/english/** |

- 错误信息使用的语言。 lang\_name可以作为语言名称给出，也可以作为安装语言文件的目录的完整路径名称。参见第10.12节，"设置错误信息语言"。

* - 应该使用--lc-messages-dir和--lc-messages，而不是--language，后者已被弃用（并作为--lc-messages-dir的同义词处理）。你应该期待--语言选项在未来的MySQL版本中被删除。
* [--large-pages](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_large-pages)

|  |  |
| --- | --- |
| **Command-Line Format** | **--large-pages[={OFF|ON}]** |
| **System Variable** | [**large\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_large_pages) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Platform Specific** | Linux |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 一些硬件/操作系统架构支持大于默认值（通常为4KB）的内存页。这种支持的实际实现取决于底层硬件和操作系统。执行大量内存访问的应用程序可以通过使用大页来获得性能改进，因为减少了转换旁观缓冲区（TLB）的错过。

* - MySQL支持大页面支持的Linux实现（在Linux中称为HugeTLB）。见第8.12.3.2节，"启用大页面支持"。关于Solaris对大页面的支持，见--超级大页面选项的描述。
* [--large-pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_large-pages) is disabled by default.

* [--lc-messages=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_lc-messages)***[locale\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_lc-messages)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--lc-messages=name** |
| **System Variable** | [**lc\_messages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_messages) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **en\_US** |

* - 错误信息所使用的语言环境。默认是en\_US。服务器将该参数转换为语言名称，并与-lc-messages-dir的值相结合，产生错误信息文件的位置。参见第10.12节，"设置错误信息语言"
* [--lc-messages-dir=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_lc-messages-dir)***[dir\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_lc-messages-dir)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--lc-messages-dir=dir\_name** |
| **System Variable** | [**lc\_messages\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_messages_dir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |

* - 错误信息所在的目录。服务器使用该值和-lc-messages的值来产生错误信息文件的位置。参见第10.12节，"设置错误信息语言"。
* [--local-service](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_local-service)

|  |  |
| --- | --- |
| **Command-Line Format** | **--local-service** |

* - (仅Windows) 在服务名称后面的--local-service选项会使服务器使用具有有限系统权限的LocalService Windows账户运行。如果在服务名称后面同时给出-defaults-file和-local-service，它们可以是任何顺序。参见第2.3.4.8节，"以Windows服务方式启动MySQL"。
* [--log-error[=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-error)***[file\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-error)***[]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-error)

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-error[=file\_name]** |
| **System Variable** | [**log\_error**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |

- 将默认的错误日志目的地设置为命名的文件。这将影响到以默认目标为基础的日志汇的输出目标。参见第5.4.2节，"错误日志"。

- 如果该选项没有命名文件，那么在Unix和类似Unix的系统中，默认的错误日志目的地是数据目录中一个名为host\_name.err的文件。除非指定了-pid-file选项，否则Windows上的默认目标也是一样的。在这种情况下，文件名是数据目录中后缀为.err的PID文件基本名。

- 如果该选项命名了一个文件，默认目标是位于数据目录下的该文件（如果文件名没有后缀，则添加.err后缀），除非给出绝对路径名以指定不同的位置。

- 如果错误日志输出不能被重定向到错误日志文件，就会发生错误，启动失败。

* - 在Windows上，如果同时给出--console，则优先于--log-error。在这种情况下，默认的错误日志目的地是控制台而不是一个文件。
* [--log-isam[=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-isam)***[file\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-isam)***[]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-isam)

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-isam[=file\_name]** |
| **Type** | File name |

* Log all **MyISAM** changes to this file (used only when debugging **MyISAM**).

* [--log-raw](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-raw)

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-raw[={OFF|ON}]** |
| **System Variable (≥ 8.0.19)** | [**log\_raw**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_raw) |
| **Scope (≥ 8.0.19)** | Global |
| **Dynamic (≥ 8.0.19)** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies (≥ 8.0.19)** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 写入一般查询日志、慢速查询日志和二进制日志的某些语句中的密码会被服务器重写，不会以纯文本的形式出现。通过使用--log-raw选项启动服务器，可以抑制对一般查询日志的密码重写。这个选项对于诊断来说可能很有用，可以看到服务器收到的语句的确切文本，但出于安全原因，不建议在生产中使用。

- 如果安装了查询重写插件，--log-raw选项对语句记录的影响如下。

o 如果没有--log-raw，服务器会记录由查询重写插件返回的语句。这可能与收到的语句不同。

o 使用--log-raw，服务器会记录收到的原始语句。

* 更多信息，请参见第6.1.2.3节，"密码和日志"。
* [--log-short-format](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-short-format)

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-short-format[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Log less information to the slow query log, if it has been activated.

* [--log-tc=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-tc)***[file\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-tc)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-tc=file\_name** |
| **Type** | File name |
| **Default Value** | **tc.log** |

* - 内存映射的事务协调器日志文件的名称（用于禁用二进制日志时影响多个存储引擎的XA事务）。默认名称是tc.log。如果没有给出完整的路径名称，该文件将在数据目录下创建。此选项未使用。
* [--log-tc-size=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-tc-size)***[size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_log-tc-size)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-tc-size=#** |
| **Type** | Integer |
| **Default Value** | **6 \* page size** |
| **Minimum Value** | **6 \* page size** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* - 以字节为单位的内存映射的事务协调器日志的大小。默认值和最小值是页面大小的6倍，并且该值必须是页面大小的倍数。
* [--memlock](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_memlock)

|  |  |
| --- | --- |
| **Command-Line Format** | **--memlock[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 锁定内存中的mysqld进程。如果你有一个问题，操作系统导致mysqld交换到磁盘，这个选项可能会有帮助。

--memlock在支持mlockall()系统调用的系统上工作；这包括Solaris、大多数使用2.4或更高内核的Linux发行版，也许还有其他Unix系统。在Linux系统上，你可以通过检查mlockall()是否在系统的mman.h文件中定义，来判断是否支持mlockall()（也就是这个选项），比如这样。

- shell> grep mlockall /usr/include/sys/mman.h

- 如果mlockall()被支持，你应该在前面命令的输出中看到类似下面的内容。

- extern int mlockall (int \_\_flags) \_\_THROW;

- 重要提示

- 使用这个选项可能需要你以root身份运行服务器，出于安全考虑，这通常不是一个好主意。见第6.1.5节，"如何以普通用户身份运行MySQL"。

- 在Linux上，也许还有其他系统，你可以通过改变limit.conf文件来避免以root身份运行服务器的需要。见第8.12.3.2节 "启用大页面支持 "中关于memlock限制的说明。

* - 你不能在不支持mlockall()系统调用的系统上使用这个选项；如果你这样做，mysqld很可能在你试图启动它时就退出。
* [--myisam-block-size=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_myisam-block-size)***[N](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_myisam-block-size)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-block-size=#** |
| **Type** | Integer |
| **Default Value** | **1024** |
| **Minimum Value** | **1024** |
| **Maximum Value** | **16384** |

* The block size to be used for **MyISAM** index pages.

* [--no-defaults](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_no-defaults)

不读取任何选项文件。如果由于从选项文件中读取未知的选项而导致程序启动失败，可以使用--no-defaults来阻止它们被读取。如果使用这个选项，它必须是命令行中的第一个选项。

关于这个选项和其他选项文件选项的其他信息。

see [Section 4.2.2.3, “Command-Line Options that Affect Option-File Handling”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option-file-options).

* [--no-dd-upgrade](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_no-dd-upgrade)

|  |  |
| --- | --- |
| **Command-Line Format** | **--no-dd-upgrade[={OFF|ON}]** |
| **Deprecated** | 8.0.16 |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* **Note**
* - 从MySQL 8.0.16开始，这个选项已被废弃。它被-upgrade选项所取代，后者对数据字典和服务器升级行为提供了更精细的控制。
* - 防止在MySQL服务器启动过程中自动升级数据字典表。这个选项通常用于在将现有安装就地升级到较新的MySQL版本后启动MySQL服务器，这可能包括对数据字典表定义的改变。
* - 当指定--no-dd-upgrade时，如果服务器发现其预期的数据字典版本与存储在数据字典本身的版本不同，则启动失败，出现错误，说明数据字典升级被禁止。
* - [ERROR] [MY-011091] [Server] 数据字典的升级被命令行选项'--no\_dd'禁止。
* - 命令行选项'--no\_dd\_upgrade'禁止数据字典升级。
* - [ERROR] [MY-010020] [Server] 数据字典初始化失败。
* - 在正常的启动过程中，服务器的数据字典版本会与存储在数据字典中的版本进行比较，以确定是否应该升级数据字典的表定义。如果有必要并且支持升级，服务器会用更新的定义创建数据字典表，把持久化的元数据复制到新的表中，用新的表原子化地替换旧的表，并重新初始化数据字典。如果不需要升级，则继续启动而不更新数据字典表。
* [--no-monitor](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_no-monitor)

|  |  |
| --- | --- |
| **Command-Line Format** | **--no-monitor[={OFF|ON}]** |
| **Introduced** | 8.0.12 |
| **Platform Specific** | Windows |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- (仅Windows)。这个选项抑制了用于实现RESTART语句的分叉。分叉使一个进程作为另一个进程的监视器，而另一个进程则作为服务器。对于用这个选项启动的服务器，RESTART只是退出，并不重新启动。

* --no-monitor在MySQL 8.0.12之前是不可用的。--gdb选项可以作为一种变通方法。
* [--old-style-user-limits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_old-style-user-limits)

|  |  |
| --- | --- |
| **Command-Line Format** | **--old-style-user-limits[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 启用旧式的用户限制。(在MySQL 5.0.3之前，账户资源限制是为用户连接的每台主机而不是用户表中的每条账户行分别计算的)。见第6.2.20节，"设置账户资源限制"。

--performance-schema-xxx

* 配置一个性能模式选项。详情请参见第27.14节 "性能模式命令选项"。
* [--plugin-load=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_plugin-load)***[plugin\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_plugin-load)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--plugin-load=plugin\_list** |
| **System Variable** | **plugin\_load** |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

- 这个选项告诉服务器在启动时加载指定的插件。如果给出了多个--plugin-load选项，那么只有最后一个选项适用。其他要加载的插件可以用--plugin-load-add选项来指定。

- 选项值是一个分号分隔的plugin\_library和name=plugin\_library值的列表。每个plugin\_library是包含插件代码的库文件的名称，每个name是要加载的插件的名称。如果一个插件库的名称中没有任何前面的插件名称，服务器就会加载库中的所有插件。如果有一个前面的插件名称，服务器就只从库中加载命名的插件。服务器会在plugin\_dir系统变量命名的目录中寻找插件库文件。

- 例如，如果名为myplug1和myplug2的插件包含在插件库文件myplug1.so和myplug2.so中，使用这个选项来执行早期插件加载。

- mysqld --plugin-load="myplug1=myplug1.so;myplug2=myplug2.so"

- 参数值周围有引号，因为否则一些命令解释器会将分号（；）解释为特殊字符。(例如，Unix shells把它当作一个命令终止符）。

- 每个命名的插件只为mysqld的一次调用加载。在重新启动后，除非再次使用--plugin-load，否则该插件不会被加载。这与INSTALL PLUGIN相反，后者在mysql.plugins表中添加了一个条目，使该插件在每次正常的服务器启动时被加载。

- 在正常的启动序列中，服务器通过读取mysql.plugins系统表来决定要加载哪些插件。如果服务器以--skip-grant-tables选项启动，在mysql.plugins表中注册的插件就不会被加载，并且不可用。--plugin-load使插件能够被加载，即使在给出--skip-grant-tables的情况下。--plugin-load还可以在启动时加载那些在运行时无法加载的插件。

- 关于插件加载的其他信息，请参见第5.6.1节，"安装和卸载插件"。

* [--plugin-load-add=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_plugin-load-add)***[plugin\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_plugin-load-add)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--plugin-load-add=plugin\_list** |
| **System Variable** | **plugin\_load\_add** |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

- 这个选项是对--plugin-load选项的补充。--plugin-load-add将一个或多个插件添加到启动时要加载的插件集合中。参数的格式与--plugin-load相同。--plugin-load-add可以用来避免用一个长的、不方便的--plugin-load参数来指定一大批插件。

--plugin-load-add可以在没有--plugin-load的情况下给出，但是任何出现在 --plugin-load之前的 --plugin-load-add实例都没有作用，因为 --plugin-load会重置要加载的插件集。换句话说，这些选项。

--plugin-load=x --plugin-load-add=y

- 都等同于这个选项。

--plugin-load="x;y"

- 但是这些选项。

--plugin-load-add=y --plugin-load=x

- 等同于这个选项。

--plugin-load=x

- 关于插件加载的其他信息，请参见第5.6.1节，"安装和卸载插件"。

--plugin-xxx

指定一个与服务器插件有关的选项。例如，许多存储引擎可以作为插件来构建，对于这样的引擎，可以用--plugin的前缀来指定它们的选项。因此，InnoDB的-innodb-file-per-table选项可以被指定为--plugin-innodb-file-per-table。

对于可以启用或禁用的布尔选项，也支持--skip前缀和其他替代格式（参见章节4.2.2.4，"程序选项修改器"）。例如，--skip-plugin-innodb-file-per-table可以禁用innodb-file-per-table。

使用 --plugin 前缀的理由是，如果插件选项与内置的服务器选项有名称冲突，它可以明确地指定插件选项。例如，如果一个插件编写者将一个插件命名为 "sql"，并实现了一个 "mode "选项，那么该选项的名称可能是-sql-mode，这将与同名的内置选项冲突。在这种情况下，对冲突名称的引用会被解析为有利于内置选项。为了避免歧义，用户可以指定插件选项为--plugin-sql-mode。建议对插件选项使用--plugin前缀，以避免任何歧义的问题。

* [--port=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_port)***[port\_num](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_port)***, -P ***port\_num***

|  |  |
| --- | --- |
| **Command-Line Format** | **--port=port\_num** |
| **System Variable** | [**port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_port) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **3306** |
| **Minimum Value** | **0** |
| **Maximum Value** | **65535** |

* - 在监听TCP/IP连接时要使用的端口号。在Unix和类Unix系统上，端口号必须是1024或更高，除非服务器是由操作系统的根用户启动的。将此选项设置为0会导致使用默认值。
* [--port-open-timeout=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_port-open-timeout)***[num](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_port-open-timeout)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--port-open-timeout=#** |
| **Type** | Integer |
| **Default Value** | **0** |

- 在某些系统上，当服务器被停止时，TCP/IP端口可能不会立即变得可用。如果服务器随后迅速重新启动，它重新打开端口的尝试就会失败。这个选项表示如果TCP/IP端口不能被打开，服务器应该等待多少秒，使其成为空闲。默认情况是不等待。

--print-defaults

打印程序名称和它从选项文件中获得的所有选项。密码值被屏蔽。如果使用这个选项，它必须是命令行中的第一个选项，但它可以紧接着--defaults-file或--defaults-extra-file使用。

* 关于这个选项和其他选项文件的其他信息，见第4.2.2.3节，"影响选项文件处理的命令行选项"。
* [--remove [](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_remove)***[service\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_remove)***[]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_remove)

|  |  |
| --- | --- |
| **Command-Line Format** | **--remove [service\_name]** |
| **Platform Specific** | Windows |

* - (仅Windows)删除一个MySQL Windows服务。如果没有给出service\_name值，则默认的服务名称是MySQL。欲了解更多信息，请参见第2.3.4.8节 "将MySQL作为Windows服务启动"。
* [--safe-user-create](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_safe-user-create)

|  |  |
| --- | --- |
| **Command-Line Format** | **--safe-user-create[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 如果该选项被启用，用户不能通过使用GRANT语句来创建新的MySQL用户，除非该用户对mysql.user系统表或该表的任何列有INSERT权限。如果你想让一个用户有能力创建新的用户，这些用户具有该用户有权授予的那些权限，你应该授予该用户以下权限。

- GRANT INSERT(user) ON mysql.user TO 'user\_name'@'host\_name'。

* - 这就保证了用户不能直接改变任何特权列，而必须使用GRANT语句来给其他用户以特权。
* [--skip-grant-tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_skip-grant-tables)

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-grant-tables[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 这个选项会影响服务器的启动顺序。

o --skip-grant-tables导致服务器不读取mysql系统模式中的grant表，因此在启动时根本不使用特权系统。这使得任何有权限进入服务器的人都可以不受限制地访问所有数据库。

因为用--skip-grant-tables启动服务器会禁用认证检查，在这种情况下，服务器也会通过启用skip\_networking禁用远程连接。

要使以--skip-grant-tables启动的服务器在运行时加载授予表，请执行权限刷新操作，可以通过这些方式进行。

在连接到服务器后发出MySQL FLUSH PRIVILEGES语句。

从命令行执行 mysqladmin flush-privileges 或 mysqladmin reload 命令。

权限刷新也可能由于启动后执行的其他操作而隐式发生，从而导致服务器开始使用授予表。例如，如果服务器在启动过程中执行了升级，就会刷新权限。

o --skip-grant-tables 禁用失败登录跟踪和临时账户锁定，因为这些功能依赖于授予表。参见第6.2.15节，"密码管理"。

o --skip-grant-tables导致服务器不加载在数据字典或mysql系统模式中注册的某些其他对象。

使用CREATE EVENT安装并在事件数据字典表中注册的预定事件。

使用INSTALL PLUGIN安装并在mysql.plugin系统表中注册的插件。

要使插件在使用--skip-grant-tables时也能被加载，请使用--plugin-load或--plugin-load-add选项。

使用CREATE FUNCTION安装并在mysql.func系统表中注册的可加载函数。

--skip-grant-tables不会在组件启动时抑制加载。

o --skip-grant-tables导致disabled\_storage\_engines系统变量没有影响。

--skip-host-cache

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-host-cache** |

- 禁用内部主机缓存以加快名称到IP的解析。在禁用缓存的情况下，服务器在每次客户端连接时都会执行一次DNS查询。

- 使用--skip-host-cache类似于将host\_cache\_size系统变量设置为0，但是host\_cache\_size更加灵活，因为它也可以用来在运行时调整主机缓存的大小、启用或禁用，而不仅仅是在服务器启动时。

- 用--skip-host-cache启动服务器并不能阻止运行时对host\_cache\_size值的改变，但是这样的改变没有效果，即使host\_cache\_size被设置得大于0，缓存也不会被重新启用。

- 关于主机缓存如何工作的更多信息，请参见5.1.12.3节，"DNS查询和主机缓存"。

--skip-innodb

禁用InnoDB存储引擎。在这种情况下，由于默认的存储引擎是InnoDB，服务器不会启动，除非你同时使用--default-storage-engine和--default-tmp-storage-engine将永久表和TEMPORARY表的默认设置为其他引擎。

InnoDB存储引擎不能被禁用，而且--skip-innodb选项已经被废弃，没有任何作用。使用它的结果是一个警告。预计这个选项将在未来的MySQL版本中被删除。

* [--skip-new](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_skip-new)

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-new** |

* - 这个选项禁用了（过去被认为是）新的、可能不安全的行为。它导致这些设置：delay\_key\_write=OFF, concurrent\_insert=NEVER, automatic\_sp\_privileges=OFF。对于不支持OPTIMIZE TABLE的存储引擎，它还会导致OPTIMIZE TABLE被映射为ALTER TABLE。
* [--skip-show-database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_skip-show-database)

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-show-database** |
| **System Variable** | [**skip\_show\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_show_database) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* - 这个选项设置了skip\_show\_database系统变量，这个变量控制谁被允许使用SHOW DATABASES语句。参见章节5.1.8, "服务器系统变量"。
* [--skip-stack-trace](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_skip-stack-trace)

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-stack-trace** |

* Do not write stack traces. This option is useful when you are running **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** under a debugger. On some systems, you also must use this option to get a core file. See [Section 5.9, “Debugging MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#debugging-mysql).

* [--slow-start-timeout=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_slow-start-timeout)***[timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_slow-start-timeout)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--slow-start-timeout=#** |
| **Type** | Integer |
| **Default Value** | **15000** |

* This option controls the Windows service control manager's service start timeout. The value is the maximum number of milliseconds that the service control manager waits before trying to kill the windows service during startup. The default value is 15000 (15 seconds). If the MySQL service takes too long to start, you may need to increase this value. A value of 0 means there is no timeout.

* [--socket=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_socket)***[path](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_socket)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--socket={file\_name|pipe\_name}** |
| **System Variable** | [**socket**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_socket) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value (Windows)** | **MySQL** |
| **Default Value (Other)** | **/tmp/mysql.sock** |

* On Unix, this option specifies the Unix socket file to use when listening for local connections. The default value is /tmp/mysql.sock. If this option is given, the server creates the file in the data directory unless an absolute path name is given to specify a different directory. On Windows, the option specifies the pipe name to use when listening for local connections that use a named pipe. The default value is **MySQL** (not case-sensitive).

* [--sql-mode=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)***[value](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)***[[,](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)***[value](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)***[[,](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)***[value](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)***[...]]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)

|  |  |
| --- | --- |
| **Command-Line Format** | **--sql-mode=name** |
| **System Variable** | [**sql\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_mode) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Set |
| **Default Value** | **ONLY\_FULL\_GROUP\_BY STRICT\_TRANS\_TABLES NO\_ZERO\_IN\_DATE NO\_ZERO\_DATE ERROR\_FOR\_DIVISION\_BY\_ZERO NO\_ENGINE\_SUBSTITUTION** |
| **Valid Values** | **ALLOW\_INVALID\_DATES**  **ANSI\_QUOTES**  **ERROR\_FOR\_DIVISION\_BY\_ZERO**  **HIGH\_NOT\_PRECEDENCE**  **IGNORE\_SPACE**  **NO\_AUTO\_VALUE\_ON\_ZERO**  **NO\_BACKSLASH\_ESCAPES**  **NO\_DIR\_IN\_CREATE**  **NO\_ENGINE\_SUBSTITUTION**  **NO\_UNSIGNED\_SUBTRACTION**  **NO\_ZERO\_DATE**  **NO\_ZERO\_IN\_DATE**  **ONLY\_FULL\_GROUP\_BY**  **PAD\_CHAR\_TO\_FULL\_LENGTH**  **PIPES\_AS\_CONCAT**  **REAL\_AS\_FLOAT**  **STRICT\_ALL\_TABLES**  **STRICT\_TRANS\_TABLES**  **TIME\_TRUNCATE\_FRACTIONAL** |

* Set the SQL mode. See [Section 5.1.11, “Server SQL Modes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode).
* **Note**
* MySQL installation programs may configure the SQL mode during the installation process.
* If the SQL mode differs from the default or from what you expect, check for a setting in an option file that the server reads at startup.

* [--ssl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_ssl), [--skip-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl)

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl[={OFF|ON}]** |
| **Deprecated** | 8.0.26 |
| **Disabled by** | **skip-ssl** |
| **Type** | Boolean |
| **Default Value** | **ON** |

* The [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) option specifies that the server permits but does not require encrypted connections on the main connection interface. This option is enabled by default.
* A similar option, [--admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl), is like the [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl), except that it applies to the administrative connection interface rather than the main connection interface. For information about these interfaces, see [Section 5.1.12.1, “Connection Interfaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces).
* [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) can be specified in negated form as [--skip-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) or a synonym ([--ssl=OFF](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl), [--disable-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl)). In this case, the option specifies that the server does not permit encrypted connections, regardless of the settings of the **tls\_*xxx*** and **ssl\_*xxx*** system variables.
* The [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) option has an effect only at server startup on whether the server supports encrypted connections. It is ignored and has no effect on the operation of [**ALTER INSTANCE RELOAD TLS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-instance-reload-tls) at runtime. For example, you can use [--ssl=OFF](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) to start the server with encrypted connections disabled, then reconfigure TLS and execute **ALTER INSTANCE RELOAD TLS** to enable encrypted connections at runtime.
* For more information about configuring whether the server permits clients to connect using SSL and indicating where to find SSL keys and certificates, see [Section 6.3.1, “Configuring MySQL to Use Encrypted Connections”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections), which also describes server capabilities for certificate and key file autogeneration and autodiscovery. Consider setting at least the **[ssl\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_cert)** and **[ssl\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_key)** system variables on the server side and the [--ssl-ca](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_ssl-ca) (or [--ssl-capath](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_ssl-capath)) option on the client side.
* Because support for encrypted connections is enabled by default, it is normally unnecessary to specify [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl). As of MySQL 8.0.26, [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) is deprecated and subject to removal in a future MySQL version. If it is desired to disable encrypted connections, that can be done without specifying [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) in negated form. Set the **[tls\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tls_version)** system variable to the empty value to indicate that no TLS versions are supported. For example, these lines in the server my.cnf file disable encrypted connections:
* [mysqld]
* tls\_version=''

* [--standalone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_standalone)

|  |  |
| --- | --- |
| **Command-Line Format** | **--standalone** |
| **Platform Specific** | Windows |

* Available on Windows only; instructs the MySQL server not to run as a service.

* [--super-large-pages](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_super-large-pages)

|  |  |
| --- | --- |
| **Command-Line Format** | **--super-large-pages[={OFF|ON}]** |
| **Platform Specific** | Solaris |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Standard use of large pages in MySQL attempts to use the largest size supported, up to 4MB. Under Solaris, a “super large pages” feature enables uses of pages up to 256MB. This feature is available for recent SPARC platforms. It can be enabled or disabled by using the [--super-large-pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_super-large-pages) or [--skip-super-large-pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_super-large-pages) option.

* [--symbolic-links](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_symbolic-links), [--skip-symbolic-links](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_symbolic-links)

|  |  |
| --- | --- |
| **Command-Line Format** | **--symbolic-links[={OFF|ON}]** |
| **Deprecated** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Enable or disable symbolic link support. On Unix, enabling symbolic links means that you can link a **MyISAM** index file or data file to another directory with the **INDEX DIRECTORY** or **DATA DIRECTORY** option of the [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) statement. If you delete or rename the table, the files that its symbolic links point to also are deleted or renamed. See [Section 8.12.2.2, “Using Symbolic Links for MyISAM Tables on Unix”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#symbolic-links-to-tables).
* **Note**
* Symbolic link support, along with the [--symbolic-links](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_symbolic-links) option that controls it, is deprecated; you should expect it to be removed in a future version of MySQL. In addition, the option is disabled by default. The related **[have\_symlink](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_symlink)** system variable also is deprecated; expect it be removed in a future version of MySQL.
* This option has no meaning on Windows.

* [--sysdate-is-now](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sysdate-is-now)

|  |  |
| --- | --- |
| **Command-Line Format** | **--sysdate-is-now[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* [**SYSDATE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_sysdate) by default returns the time at which it executes, not the time at which the statement in which it occurs begins executing. This differs from the behavior of [**NOW()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_now). This option causes [**SYSDATE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_sysdate) to be a synonym for [**NOW()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_now). For information about the implications for binary logging and replication, see the description for [**SYSDATE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_sysdate) in [Section 12.7, “Date and Time Functions”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#date-and-time-functions) and for **SET TIMESTAMP** in [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables).

* [--tc-heuristic-recover={COMMIT|ROLLBACK}](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_tc-heuristic-recover)

|  |  |
| --- | --- |
| **Command-Line Format** | **--tc-heuristic-recover=name** |
| **Type** | Enumeration |
| **Default Value** | **OFF** |
| **Valid Values** | **OFF**  **COMMIT**  **ROLLBACK** |

* The decision to use in a manual heuristic recovery.
* If a **--tc-heuristic-recover** option is specified, the server exits regardless of whether manual heuristic recovery is successful.
* On systems with more than one storage engine capable of two-phase commit, the **ROLLBACK** option is not safe and causes recovery to halt with the following error:
* [ERROR] --tc-heuristic-recover rollback
* strategy is not safe on systems with more than one 2-phase-commit-capable
* storage engine. Aborting crash recovery.

* [--transaction-isolation=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_transaction-isolation)***[level](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_transaction-isolation)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--transaction-isolation=name** |
| **System Variable** | [**transaction\_isolation**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_isolation) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **REPEATABLE-READ** |
| **Valid Values** | **READ-UNCOMMITTED**  **READ-COMMITTED**  **REPEATABLE-READ**  **SERIALIZABLE** |

* Sets the default transaction isolation level. The **level** value can be [**READ-UNCOMMITTED**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#isolevel_read-uncommitted), [**READ-COMMITTED**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#isolevel_read-committed), [**REPEATABLE-READ**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#isolevel_repeatable-read), or [**SERIALIZABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#isolevel_serializable). See [Section 13.3.7, “SET TRANSACTION Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction).
* The default transaction isolation level can also be set at runtime using the [**SET TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) statement or by setting the **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)** system variable.

* [--transaction-read-only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_transaction-read-only)

|  |  |
| --- | --- |
| **Command-Line Format** | **--transaction-read-only[={OFF|ON}]** |
| **System Variable** | [**transaction\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_read_only) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Sets the default transaction access mode. By default, read-only mode is disabled, so the mode is read/write.
* To set the default transaction access mode at runtime, use the [**SET TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) statement or set the **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)** system variable. See [Section 13.3.7, “SET TRANSACTION Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction).

* [--tmpdir=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_tmpdir)***[dir\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_tmpdir)***, -t ***dir\_name***

|  |  |
| --- | --- |
| **Command-Line Format** | **--tmpdir=dir\_name** |
| **System Variable** | [**tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tmpdir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |

* The path of the directory to use for creating temporary files. It might be useful if your default **/tmp** directory resides on a partition that is too small to hold temporary tables. This option accepts several paths that are used in round-robin fashion. Paths should be separated by colon characters (**:**) on Unix and semicolon characters (**;**) on Windows.
* [--tmpdir](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_tmpdir) can be a non-permanent location, such as a directory on a memory-based file system or a directory that is cleared when the server host restarts. If the MySQL server is acting as a replica, and you are using a non-permanent location for [--tmpdir](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_tmpdir), consider setting a different temporary directory for the replica using the **[slave\_load\_tmpdir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_slave_load_tmpdir)** system variable. For a replica, the temporary files used to replicate [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data) statements are stored in this directory, so with a permanent location they can survive machine restarts, although replication can now continue after a restart if the temporary files have been removed.
* For more information about the storage location of temporary files, see [Section B.3.3.5, “Where MySQL Stores Temporary Files”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#temporary-files).

* [--upgrade=](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_upgrade)***[value](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_upgrade)***

|  |  |
| --- | --- |
| **Command-Line Format** | **--upgrade=value** |
| **Introduced** | 8.0.16 |
| **Type** | Enumeration |
| **Default Value** | **AUTO** |
| **Valid Values** | **AUTO**  **NONE**  **MINIMAL**  **FORCE** |

* This option controls whether and how the server performs an automatic upgrade at startup. Automatic upgrade involves two steps:
  + Step 1: Data dictionary upgrade.

This step upgrades:

* + - The data dictionary tables in the **mysql** schema. If the actual data dictionary version is lower than the current expected version, the server upgrades the data dictionary. If it cannot, or is prevented from doing so, the server cannot run.
    - The Performance Schema and **INFORMATION\_SCHEMA**.
  + Step 2: Server upgrade.

This step comprises all other upgrade tasks. If the existing installation data has a lower MySQL version than the server expects, it must be upgraded:

* + - The system tables in the **mysql** schema (the remaining non-data dictionary tables).
    - The **sys** schema.
    - User schemas.

For details about upgrade steps 1 and 2, see [Section 2.11.3, “What the MySQL Upgrade Process Upgrades”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#upgrading-what-is-upgraded).

These [--upgrade](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_upgrade) option values are permitted:

* + **AUTO**

The server performs an automatic upgrade of anything it finds to be out of date (steps 1 and 2). This is the default action if [--upgrade](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_upgrade) is not specified explicitly.

* + **NONE**

The server performs no automatic upgrade steps during the startup process (skips steps 1 and 2). Because this option value prevents a data dictionary upgrade, the server exits with an error if the data dictionary is found to be out of date:

[ERROR] [MY-013381] [Server] Server shutting down because upgrade is

required, yet prohibited by the command line option '--upgrade=NONE'.

[ERROR] [MY-010334] [Server] Failed to initialize DD Storage Engine

[ERROR] [MY-010020] [Server] Data Dictionary initialization failed.

* + **MINIMAL**

The server upgrades the data dictionary, the Performance Schema, and the **INFORMATION\_SCHEMA**, if necessary (step 1). Note that following an upgrade with this option, Group Replication cannot be started, because system tables on which the replication internals depend are not updated, and reduced functionality might also be apparent in other areas.

* + **FORCE**

The server upgrades the data dictionary, the Performance Schema, and the **INFORMATION\_SCHEMA**, if necessary (step 1). In addition, the server forces an upgrade of everything else (step 2). Expect server startup to take longer with this option because the server checks all objects in all schemas.

**FORCE** is useful to force step 2 actions to be performed if the server thinks they are not necessary. For example, you may believe that a system table is missing or has become damaged and want to force a repair.

The following table summarizes the actions taken by the server for each option value.

| **Option Value** | **Server Performs Step 1?** | **Server Performs Step 2?** |
| --- | --- | --- |
| **AUTO** | If necessary | If necessary |
| **NONE** | No | No |
| **MINIMAL** | If necessary | No |
| **FORCE** | If necessary | Yes |

* [--user={](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_user)***[user\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_user)***[|](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_user)***[user\_id](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_user)***[}](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_user), -u {***user\_name***|***user\_id***}

|  |  |
| --- | --- |
| **Command-Line Format** | **--user=name** |
| **Type** | String |

* Run the **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** server as the user having the name ***user\_name*** or the numeric user ID ***user\_id***. (“User” in this context refers to a system login account, not a MySQL user listed in the grant tables.)
* This option is mandatory when starting **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** as **root**. The server changes its user ID during its startup sequence, causing it to run as that particular user rather than as **root**. See [Section 6.1.1, “Security Guidelines”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#security-guidelines).
* To avoid a possible security hole where a user adds a [--user=root](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_user) option to a my.cnf file (thus causing the server to run as **root**), **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** uses only the first [--user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_user) option specified and produces a warning if there are multiple [--user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_user) options. Options in /etc/my.cnf and $MYSQL\_HOME/my.cnf are processed before command-line options, so it is recommended that you put a [--user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_user) option in /etc/my.cnf and specify a value other than **root**. The option in /etc/my.cnf is found before any other [--user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_user) options, which ensures that the server runs as a user other than **root**, and that a warning results if any other [--user](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_user) option is found.

* [--validate-config](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_validate-config)

|  |  |
| --- | --- |
| **Command-Line Format** | **--validate-config[={OFF|ON}]** |
| **Introduced** | 8.0.16 |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Validate the server startup configuration. If no errors are found, the server terminates with an exit code of 0. If an error is found, the server displays a diagnostic message and terminates with an exit code of 1. Warning and information messages may also be displayed, depending on the **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** value, but do not produce immediate validation termination or an exit code of 1. For more information, see [Section 5.1.3, “Server Configuration Validation”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-configuration-validation).

* [--validate-user-plugins[={OFF|ON}]](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_validate-user-plugins)

|  |  |
| --- | --- |
| **Command-Line Format** | **--validate-user-plugins[={OFF|ON}]** |
| **Type** | Boolean |
| **Default Value** | **ON** |

* If this option is enabled (the default), the server checks each user account and produces a warning if conditions are found that would make the account unusable:
  + The account requires an authentication plugin that is not loaded.
  + The account requires the **sha256\_password** or **caching\_sha2\_password** authentication plugin but the server was started with neither SSL nor RSA enabled as required by the plugin.

Enabling [--validate-user-plugins](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_validate-user-plugins) slows down server initialization and [**FLUSH PRIVILEGES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-privileges). If you do not require the additional checking, you can disable this option at startup to avoid the performance decrement.

* [--verbose](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_verbose), [-v](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_verbose)

Use this option with the [--help](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_help) option for detailed help.

* [--version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_version), -V

Display version information and exit.

### 5.1.8服务端系统变量

The MySQL server maintains many system variables that configure its operation. Each system variable has a default value. System variables can be set at server startup using options on the command line or in an option file. Most of them can be changed dynamically at runtime using the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement, which enables you to modify operation of the server without having to stop and restart it. You can also use system variable values in expressions.

Setting a global system variable runtime value normally requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege). Setting a session system runtime variable value normally requires no special privileges and can be done by any user, although there are exceptions. For more information, see [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges)

There are several ways to see the names and values of system variables:

* To see the values that a server uses based on its compiled-in defaults and any option files that it reads, use this command:
* mysqld --verbose --help
* To see the values that a server uses based only on its compiled-in defaults, ignoring the settings in any option files, use this command:
* mysqld --no-defaults --verbose --help
* To see the current values used by a running server, use the [**SHOW VARIABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-variables) statement or the Performance Schema system variable tables. See [Section 27.12.14, “Performance Schema System Variable Tables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-system-variable-tables).

This section provides a description of each system variable. For a system variable summary table, see [Section 5.1.5, “Server System Variable Reference”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variable-reference). For more information about manipulation of system variables, see [Section 5.1.9, “Using System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#using-system-variables).

For additional system variable information, see these sections:

* [Section 5.1.9, “Using System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#using-system-variables), discusses the syntax for setting and displaying system variable values.
* [Section 5.1.9.2, “Dynamic System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#dynamic-system-variables), lists the variables that can be set at runtime.
* Information on tuning system variables can be found in [Section 5.1.1, “Configuring the Server”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-configuration).
* [Section 15.14, “InnoDB Startup Options and System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-parameters), lists **InnoDB** system variables.
* [Section 23.3.3.9.2, “NDB Cluster System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#mysql-cluster-system-variables), lists system variables which are specific to NDB Cluster.
* For information on server system variables specific to replication, see [Section 17.1.6, “Replication and Binary Logging Options and Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-options).

**Note**

Some of the following variable descriptions refer to “enabling” or “disabling” a variable. These variables can be enabled with the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement by setting them to **ON** or **1**, or disabled by setting them to **OFF** or **0**. Boolean variables can be set at startup to the values **ON**, **TRUE**, **OFF**, and **FALSE** (not case-sensitive), as well as **1** and **0**. See [Section 4.2.2.4, “Program Option Modifiers”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option-modifiers).

Some system variables control the size of buffers or caches. For a given buffer, the server might need to allocate internal data structures. These structures typically are allocated from the total memory allocated to the buffer, and the amount of space required might be platform dependent. This means that when you assign a value to a system variable that controls a buffer size, the amount of space actually available might differ from the value assigned. In some cases, the amount might be less than the value assigned. It is also possible that the server adjusts a value upward. For example, if you assign a value of 0 to a variable for which the minimal value is 1024, the server sets the value to 1024.

Values for buffer sizes, lengths, and stack sizes are given in bytes unless otherwise specified.

Some system variables take file name values. Unless otherwise specified, the default file location is the data directory if the value is a relative path name. To specify the location explicitly, use an absolute path name. Suppose that the data directory is /var/mysql/data. If a file-valued variable is given as a relative path name, it is located under /var/mysql/data. If the value is an absolute path name, its location is as given by the path name.

* **[activate\_all\_roles\_on\_login](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_activate_all_roles_on_login)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--activate-all-roles-on-login[={OFF|ON}]** |
| **System Variable** | [**activate\_all\_roles\_on\_login**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_activate_all_roles_on_login) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether to enable automatic activation of all granted roles when users log in to the server:
  + If **[activate\_all\_roles\_on\_login](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_activate_all_roles_on_login)** is enabled, the server activates all roles granted to each account at login time. This takes precedence over default roles specified with [**SET DEFAULT ROLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-default-role).
  + If **[activate\_all\_roles\_on\_login](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_activate_all_roles_on_login)** is disabled, the server activates the default roles specified with [**SET DEFAULT ROLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-default-role), if any, at login time.

Granted roles include those granted explicitly to the user and those named in the **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** system variable value.

[**activate\_all\_roles\_on\_login**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_activate_all_roles_on_login) applies only at login time, and at the beginning of execution for stored programs and views that execute in definer context. To change the active roles within a session, use [**SET ROLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-role). To change the active roles for a stored program, the program body should execute [**SET ROLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-role).

* **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-address=addr** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**admin\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_address) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The IP address on which to listen for TCP/IP connections on the administrative network interface (see [Section 5.1.12.1, “Connection Interfaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces)). There is no default **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** value. If this variable is not specified at startup, the server maintains no administrative interface. The server also has a **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** system variable for configuring regular (nonadministrative) client TCP/IP connections. See [Section 5.1.12.1, “Connection Interfaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces).
* If **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** is specified, its value must satisfy these requirements:
  + The value must be a single IPv4 address, IPv6 address, or host name.
  + The value cannot specify a wildcard address format (**\***, **0.0.0.0**, or **::**).
  + As of MySQL 8.0.22, the value may include a network namespace specifier.

An IP address can be specified as an IPv4 or IPv6 address. If the value is a host name, the server resolves the name to an IP address and binds to that address. If a host name resolves to multiple IP addresses, the server uses the first IPv4 address if there are any, or the first IPv6 address otherwise.

The server treats different types of addresses as follows:

* + If the address is an IPv4-mapped address, the server accepts TCP/IP connections for that address, in either IPv4 or IPv6 format. For example, if the server is bound to **::ffff:127.0.0.1**, clients can connect using --host=127.0.0.1 or --host=::ffff:127.0.0.1.
  + If the address is a “regular” IPv4 or IPv6 address (such as **127.0.0.1** or **::1**), the server accepts TCP/IP connections only for that IPv4 or IPv6 address.

These rules apply to specifying a network namespace for an address:

* + A network namespace can be specified for an IP address or a host name.
  + A network namespace cannot be specified for a wildcard IP address.
  + For a given address, the network namespace is optional. If given, it must be specified as a **/*ns*** suffix immediately following the address.
  + An address with no **/*ns*** suffix uses the host system global namespace. The global namespace is therefore the default.
  + An address with a **/*ns*** suffix uses the namespace named ***ns***.
  + The host system must support network namespaces and each named namespace must previously have been set up. Naming a nonexistent namespace produces an error.

For additional information about network namespaces, see [Section 5.1.14, “Network Namespace Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#network-namespace-support).

If binding to the address fails, the server produces an error and does not start.

The **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** system variable is similar to the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** system variable that binds the server to an address for ordinary client connections, but with these differences:

* + [**bind\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bind_address) permits multiple addresses. **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** permits a single address.
  + [**bind\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bind_address) permits wildcard addresses. **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** does not.

* **[admin\_port](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_port)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-port=port\_num** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**admin\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_port) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **33062** |
| **Minimum Value** | **0** |
| **Maximum Value** | **65535** |

* The TCP/IP port number to use for connections on the administrative network interface (see [Section 5.1.12.1, “Connection Interfaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces)). Setting this variable to 0 causes the default value to be used.
* Setting **[admin\_port](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_port)** has no effect if **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** is not specified because in that case the server maintains no administrative network interface.

* **[admin\_ssl\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_ca)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-ssl-ca=file\_name** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_ca) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **NULL** |

* The **[admin\_ssl\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_ca)** system variable is like **[ssl\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_ca)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).

* **[admin\_ssl\_capath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_capath)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-ssl-capath=dir\_name** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_capath) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **NULL** |

* The **[admin\_ssl\_capath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_capath)** system variable is like **[ssl\_capath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_capath)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).

* **[admin\_ssl\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_cert)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-ssl-cert=file\_name** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_cert) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **NULL** |

* The **[admin\_ssl\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_cert)** system variable is like **[ssl\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_cert)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).

* **[admin\_ssl\_cipher](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_cipher)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-ssl-cipher=name** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_cipher) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **NULL** |

* The **[admin\_ssl\_cipher](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_cipher)** system variable is like **[ssl\_cipher](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_cipher)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).

* **[admin\_ssl\_crl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_crl)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-ssl-crl=file\_name** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_crl) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **NULL** |

* The **[admin\_ssl\_crl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_crl)** system variable is like **[ssl\_crl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_crl)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).

* **[admin\_ssl\_crlpath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_crlpath)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-ssl-crlpath=dir\_name** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_crlpath) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **NULL** |

* The **[admin\_ssl\_crlpath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_crlpath)** system variable is like **[ssl\_crlpath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_crlpath)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).

* **[admin\_ssl\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_key)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-ssl-key=file\_name** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_key) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **NULL** |

* The **[admin\_ssl\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_ssl_key)** system variable is like **[ssl\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_key)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).

* **[admin\_tls\_ciphersuites](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_tls_ciphersuites)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-tls-ciphersuites=ciphersuite\_list** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_tls_ciphersuites) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **NULL** |

* The **[admin\_tls\_ciphersuites](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_tls_ciphersuites)** system variable is like **[tls\_ciphersuites](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tls_ciphersuites)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).

* **[admin\_tls\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_tls_version)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--admin-tls-version=protocol\_list** |
| **Introduced** | 8.0.21 |
| **System Variable** | [**admin\_tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_tls_version) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **TLSv1,TLSv1.1,TLSv1.2,TLSv1.3** (OpenSSL 1.1.1 and higher)  **TLSv1,TLSv1.1,TLSv1.2** (otherwise) |

* The **[admin\_tls\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_tls_version)** system variable is like **[tls\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tls_version)**, except that it applies to the administrative connection interface rather than the main connection interface. For information about configuring encryption support for the administrative interface, see [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections).
* **Note**
* As of MySQL 8.0.26, the TLSv1 and TLSv1.1 connection protocols are deprecated and support for them is subject to removal in a future version of MySQL. See [Deprecated TLS Protocols](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#encrypted-connection-deprecated-protocols).

* **[authentication\_windows\_log\_level](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_authentication_windows_log_level)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--authentication-windows-log-level=#** |
| **System Variable** | [**authentication\_windows\_log\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_authentication_windows_log_level) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **2** |
| **Minimum Value** | **0** |
| **Maximum Value** | **4** |

* This variable is available only if the **authentication\_windows** Windows authentication plugin is enabled and debugging code is enabled. See [Section 6.4.1.6, “Windows Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#windows-pluggable-authentication).
* This variable sets the logging level for the Windows authentication plugin. The following table shows the permitted values.

| **Value** | **Description** |
| --- | --- |
| 0 | No logging |
| 1 | Log only error messages |
| 2 | Log level 1 messages and warning messages |
| 3 | Log level 2 messages and information notes |
| 4 | Log level 3 messages and debug messages |

* **[authentication\_windows\_use\_principal\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_authentication_windows_use_principal_name)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--authentication-windows-use-principal-name[={OFF|ON}]** |
| **System Variable** | [**authentication\_windows\_use\_principal\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_authentication_windows_use_principal_name) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* This variable is available only if the **authentication\_windows** Windows authentication plugin is enabled. See [Section 6.4.1.6, “Windows Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#windows-pluggable-authentication).
* A client that authenticates using the **InitSecurityContext()** function should provide a string identifying the service to which it connects (***targetName***). MySQL uses the principal name (UPN) of the account under which the server is running. The UPN has the form ***user\_id*@*computer\_name*** and need not be registered anywhere to be used. This UPN is sent by the server at the beginning of authentication handshake.
* This variable controls whether the server sends the UPN in the initial challenge. By default, the variable is enabled. For security reasons, it can be disabled to avoid sending the server's account name to a client as cleartext. If the variable is disabled, the server always sends a **0x00** byte in the first challenge, the client does not specify ***targetName***, and as a result, NTLM authentication is used.
* If the server fails to obtain its UPN (which happens primarily in environments that do not support Kerberos authentication), the UPN is not sent by the server and NTLM authentication is used.

* **[autocommit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_autocommit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--autocommit[={OFF|ON}]** |
| **System Variable** | [**autocommit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_autocommit) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* The autocommit mode. If set to 1, all changes to a table take effect immediately. If set to 0, you must use [**COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) to accept a transaction or [**ROLLBACK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) to cancel it. If **[autocommit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_autocommit)** is 0 and you change it to 1, MySQL performs an automatic [**COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) of any open transaction. Another way to begin a transaction is to use a [**START TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) or [**BEGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) statement. See [Section 13.3.1, “START TRANSACTION, COMMIT, and ROLLBACK Statements”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit).
* By default, client connections begin with **[autocommit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_autocommit)** set to 1. To cause clients to begin with a default of 0, set the global **[autocommit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_autocommit)** value by starting the server with the [--autocommit=0](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_autocommit) option. To set the variable using an option file, include these lines:
* [mysqld]
* autocommit=0

* **[automatic\_sp\_privileges](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_automatic_sp_privileges)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--automatic-sp-privileges[={OFF|ON}]** |
| **System Variable** | [**automatic\_sp\_privileges**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_automatic_sp_privileges) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* When this variable has a value of 1 (the default), the server automatically grants the [**EXECUTE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_execute) and [**ALTER ROUTINE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_alter-routine) privileges to the creator of a stored routine, if the user cannot already execute and alter or drop the routine. (The [**ALTER ROUTINE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_alter-routine) privilege is required to drop the routine.) The server also automatically drops those privileges from the creator when the routine is dropped. If **[automatic\_sp\_privileges](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_automatic_sp_privileges)** is 0, the server does not automatically add or drop these privileges.
* The creator of a routine is the account used to execute the **CREATE** statement for it. This might not be the same as the account named as the **DEFINER** in the routine definition.
* If you start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with [--skip-new](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-new), **[automatic\_sp\_privileges](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_automatic_sp_privileges)** is set to **OFF**.
* See also [Section 25.2.2, “Stored Routines and MySQL Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\stored-objects.html#stored-routines-privileges).

* **[auto\_generate\_certs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_auto_generate_certs)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--auto-generate-certs[={OFF|ON}]** |
| **System Variable** | [**auto\_generate\_certs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_auto_generate_certs) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* This variable controls whether the server autogenerates SSL key and certificate files in the data directory, if they do not already exist.
* At startup, the server automatically generates server-side and client-side SSL certificate and key files in the data directory if the **[auto\_generate\_certs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_auto_generate_certs)** system variable is enabled, no SSL options other than [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) are specified, and the server-side SSL files are missing from the data directory. These files enable secure client connections using SSL; see [Section 6.3.1, “Configuring MySQL to Use Encrypted Connections”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections).
* For more information about SSL file autogeneration, including file names and characteristics, see [Section 6.3.3.1, “Creating SSL and RSA Certificates and Keys using MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#creating-ssl-rsa-files-using-mysql)
* The [**sha256\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_auto_generate_rsa_keys) and [**caching\_sha2\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_auto_generate_rsa_keys) system variables are related but control autogeneration of RSA key-pair files needed for secure password exchange using RSA over unencypted connections.

* **[avoid\_temporal\_upgrade](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_avoid_temporal_upgrade)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--avoid-temporal-upgrade[={OFF|ON}]** |
| **Deprecated** | Yes |
| **System Variable** | [**avoid\_temporal\_upgrade**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_avoid_temporal_upgrade) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable controls whether [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) implicitly upgrades temporal columns found to be in pre-5.6.4 format ([**TIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#time), [**DATETIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime), and [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns without support for fractional seconds precision). Upgrading such columns requires a table rebuild, which prevents any use of fast alterations that might otherwise apply to the operation to be performed.
* This variable is disabled by default. Enabling it causes [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) not to rebuild temporal columns and thereby be able to take advantage of possible fast alterations.
* This variable is deprecated; expect it to be removed in a future MySQL release.

* **[back\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_back_log)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--back-log=#** |
| **System Variable** | [**back\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_back_log) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **-1** (signifies autosizing; do not assign this literal value) |
| **Minimum Value** | **1** |
| **Maximum Value** | **65535** |

* The number of outstanding connection requests MySQL can have. This comes into play when the main MySQL thread gets very many connection requests in a very short time. It then takes some time (although very little) for the main thread to check the connection and start a new thread. The **[back\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_back_log)** value indicates how many requests can be stacked during this short time before MySQL momentarily stops answering new requests. You need to increase this only if you expect a large number of connections in a short period of time.
* In other words, this value is the size of the listen queue for incoming TCP/IP connections. Your operating system has its own limit on the size of this queue. The manual page for the Unix **listen()** system call should have more details. Check your OS documentation for the maximum value for this variable. **[back\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_back_log)** cannot be set higher than your operating system limit.
* The default value is the value of **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)**, which enables the permitted backlog to adjust to the maximum permitted number of connections.

* **[basedir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_basedir)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--basedir=dir\_name** |
| **System Variable** | [**basedir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_basedir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **parent of mysqld installation directory** |

* The path to the MySQL installation base directory.

* **[big\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_big_tables)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--big-tables[={OFF|ON}]** |
| **System Variable** | [**big\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_big_tables) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If enabled, the server stores all temporary tables on disk rather than in memory. This prevents most **The table *tbl\_name* is full** errors for [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) operations that require a large temporary table, but also slows down queries for which in-memory tables would suffice.
* The default value for new connections is **OFF** (use in-memory temporary tables). Normally, it should never be necessary to enable this variable. When in-memory internal temporary tables are managed by the **TempTable** storage engine (the default), and the maximum amount of memory that can be occupied by the **TempTable** storage engine is exceeded, the **TempTable** storage engine starts storing data to temporary files on disk. When in-memory temporary tables are managed by the **MEMORY** storage engine, in-memory tables are automatically converted to disk-based tables as required. For more information, see [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables).

* **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--bind-address=addr** |
| **System Variable** | [**bind\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bind_address) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **\*** |

* The MySQL server listens on one or more network sockets for TCP/IP connections. Each socket is bound to one address, but it is possible for an address to map onto multiple network interfaces. To specify how the server should listen for TCP/IP connections, set the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** system variable at server startup. The server also has an **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** system variable that enables administrative connections on a dedicated interface. See [Section 5.1.12.1, “Connection Interfaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces).
* If **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** is specified, its value must satisfy these requirements:
  + Prior to MySQL 8.0.13, **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** accepts a single address value, which may specify a single non-wildcard IP address or host name, or one of the wildcard address formats that permit listening on multiple network interfaces (**\***, **0.0.0.0**, or **::**).
  + As of MySQL 8.0.13, **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** accepts either a single value as just described, or a list of comma-separated values. When the variable names a list of multiple values, each value must specify a single non-wildcard IP address (either IPv4 or IPv6) or a host name. Wildcard address formats (**\***, **0.0.0.0**, or **::**) are not allowed in a list of values.
  + As of MySQL 8.0.22, addresses may include a network namespace specifier.

IP addresses can be specified as IPv4 or IPv6 addresses. For any value that is a host name, the server resolves the name to an IP address and binds to that address. If a host name resolves to multiple IP addresses, the server uses the first IPv4 address if there are any, or the first IPv6 address otherwise.

The server treats different types of addresses as follows:

* + If the address is **\***, the server accepts TCP/IP connections on all server host IPv4 interfaces, and, if the server host supports IPv6, on all IPv6 interfaces. Use this address to permit both IPv4 and IPv6 connections on all server interfaces. This value is the default. If the variable specifies a list of multiple values, this value is not permitted.
  + If the address is **0.0.0.0**, the server accepts TCP/IP connections on all server host IPv4 interfaces. If the variable specifies a list of multiple values, this value is not permitted.
  + If the address is **::**, the server accepts TCP/IP connections on all server host IPv4 and IPv6 interfaces. If the variable specifies a list of multiple values, this value is not permitted.
  + If the address is an IPv4-mapped address, the server accepts TCP/IP connections for that address, in either IPv4 or IPv6 format. For example, if the server is bound to **::ffff:127.0.0.1**, clients can connect using --host=127.0.0.1 or --host=::ffff:127.0.0.1.
  + If the address is a “regular” IPv4 or IPv6 address (such as **127.0.0.1** or **::1**), the server accepts TCP/IP connections only for that IPv4 or IPv6 address.

These rules apply to specifying a network namespace for an address:

* + A network namespace can be specified for an IP address or a host name.
  + A network namespace cannot be specified for a wildcard IP address.
  + For a given address, the network namespace is optional. If given, it must be specified as a **/*ns*** suffix immediately following the address.
  + An address with no **/*ns*** suffix uses the host system global namespace. The global namespace is therefore the default.
  + An address with a **/*ns*** suffix uses the namespace named ***ns***.
  + The host system must support network namespaces and each named namespace must previously have been set up. Naming a nonexistent namespace produces an error.
  + If the variable value specifies multiple addresses, it can include addresses in the global namespace, in named namespaces, or a mix.

For additional information about network namespaces, see [Section 5.1.14, “Network Namespace Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#network-namespace-support).

If binding to any address fails, the server produces an error and does not start.

Examples:

* + **bind\_address=\***

The server listens on all IPv4 or IPv6 addresses, as specified by the **\*** wildcard.

* + **bind\_address=198.51.100.20**

The server listens only on the **198.51.100.20** IPv4 address.

* + **bind\_address=198.51.100.20,2001:db8:0:f101::1**

The server listens on the **198.51.100.20** IPv4 address and the **2001:db8:0:f101::1** IPv6 address.

* + **bind\_address=198.51.100.20,\***

This produces an error because wildcard addresses are not permitted when **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** names a list of multiple values.

* + **bind\_address=198.51.100.20/red,2001:db8:0:f101::1/blue,192.0.2.50**

The server listens on the **198.51.100.20** IPv4 address in the **red** namespace, the **2001:db8:0:f101::1** IPv6 address in the **blue** namespace, and the **192.0.2.50** IPv4 address in the global namespace.

When **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** names a single value (wildcard or non-wildcard), the server listens on a single socket, which for a wildcard address may be bound to multiple network interfaces. When **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** names a list of multiple values, the server listens on one socket per value, with each socket bound to a single network interface. The number of sockets is linear with the number of values specified. Depending on operating system connection-acceptance efficiency, long value lists might incur a performance penalty for accepting TCP/IP connections.

Because file descriptors are allocated for listening sockets and network namespace files, it may be necessary to increase the **[open\_files\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_open_files_limit)** system variable.

If you intend to bind the server to a specific address, be sure that the **mysql.user** system table contains an account with administrative privileges that you can use to connect to that address. Otherwise, you cannot shut down the server. For example, if you bind the server to **\***, you can connect to it using all existing accounts. But if you bind the server to **::1**, it accepts connections only on that address. In that case, first make sure that the **'root'@'::1'** account is present in the **mysql.user** table so you can still connect to the server to shut it down.

* **[block\_encryption\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_block_encryption_mode)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--block-encryption-mode=#** |
| **System Variable** | [**block\_encryption\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_block_encryption_mode) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **aes-128-ecb** |

* This variable controls the block encryption mode for block-based algorithms such as AES. It affects encryption for [**AES\_ENCRYPT()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_aes-encrypt) and [**AES\_DECRYPT()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_aes-decrypt).
* [**block\_encryption\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_block_encryption_mode) takes a value in **aes-*keylen*-*mode*** format, where ***keylen*** is the key length in bits and ***mode*** is the encryption mode. The value is not case-sensitive. Permitted ***keylen*** values are 128, 192, and 256. Permitted ***mode*** values are **ECB**, **CBC**, **CFB1**, **CFB8**, **CFB128**, and **OFB**.
* For example, this statement causes the AES encryption functions to use a key length of 256 bits and the CBC mode:
* SET block\_encryption\_mode = 'aes-256-cbc';
* An error occurs for attempts to set **[block\_encryption\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_block_encryption_mode)** to a value containing an unsupported key length or a mode that the SSL library does not support.

* **[bulk\_insert\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bulk_insert_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--bulk-insert-buffer-size=#** |
| **System Variable** | [**bulk\_insert\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bulk_insert_buffer_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **8388608** |
| **Minimum Value** | **0** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* **MyISAM** uses a special tree-like cache to make bulk inserts faster for [**INSERT ... SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert-select), **INSERT ... VALUES (...), (...), ...**, and [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data) when adding data to nonempty tables. This variable limits the size of the cache tree in bytes per thread. Setting it to 0 disables this optimization. The default value is 8MB.
* As of MySQL 8.0.14, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[caching\_sha2\_password\_digest\_rounds](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_caching_sha2_password_digest_rounds)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--caching-sha2-password-digest-rounds=#** |
| **Introduced** | 8.0.24 |
| **System Variable** | [**caching\_sha2\_password\_digest\_rounds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_digest_rounds) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **5000** |
| **Minimum Value** | **5000** |
| **Maximum Value** | **4095000** |

* The number of hash rounds used by the **caching\_sha2\_password** authentication plugin for password storage.
* Increasing the number of hashing rounds above the default value incurs a performance penalty that correlates with the amount of increase:
  + Creating an account that uses the **caching\_sha2\_password** plugin has no impact on the client session within which the account is created, but the server must perform the hashing rounds to complete the operation.
  + For client connections that use the account, the server must perform the hashing rounds and save the result in the cache. The result is longer login time for the first client connection, but not for subsequent connections. This behavior occurs after each server restart.

* **[caching\_sha2\_password\_auto\_generate\_rsa\_keys](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_caching_sha2_password_auto_generate_rsa_keys)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--caching-sha2-password-auto-generate-rsa-keys[={OFF|ON}]** |
| **System Variable** | [**caching\_sha2\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_auto_generate_rsa_keys) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* The server uses this variable to determine whether to autogenerate RSA private/public key-pair files in the data directory if they do not already exist.
* At startup, the server automatically generates RSA private/public key-pair files in the data directory if all of these conditions are true: The [**sha256\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_auto_generate_rsa_keys) or [**caching\_sha2\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_auto_generate_rsa_keys) system variable is enabled; no RSA options are specified; the RSA files are missing from the data directory. These key-pair files enable secure password exchange using RSA over unencrypted connections for accounts authenticated by the **sha256\_password** or **caching\_sha2\_password** plugin; see [Section 6.4.1.3, “SHA-256 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sha256-pluggable-authentication), and [Section 6.4.1.2, “Caching SHA-2 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#caching-sha2-pluggable-authentication).
* For more information about RSA file autogeneration, including file names and characteristics, see [Section 6.3.3.1, “Creating SSL and RSA Certificates and Keys using MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#creating-ssl-rsa-files-using-mysql)
* The **[auto\_generate\_certs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_auto_generate_certs)** system variable is related but controls autogeneration of SSL certificate and key files needed for secure connections using SSL.

* **[caching\_sha2\_password\_private\_key\_path](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_caching_sha2_password_private_key_path)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--caching-sha2-password-private-key-path=file\_name** |
| **System Variable** | [**caching\_sha2\_password\_private\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_private_key_path) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **private\_key.pem** |

* This variable specifies the path name of the RSA private key file for the **caching\_sha2\_password** authentication plugin. If the file is named as a relative path, it is interpreted relative to the server data directory. The file must be in PEM format.
* **Important**
* Because this file stores a private key, its access mode should be restricted so that only the MySQL server can read it.
* For information about **caching\_sha2\_password**, see [Section 6.4.1.2, “Caching SHA-2 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#caching-sha2-pluggable-authentication).

* **[caching\_sha2\_password\_public\_key\_path](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_caching_sha2_password_public_key_path)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--caching-sha2-password-public-key-path=file\_name** |
| **System Variable** | [**caching\_sha2\_password\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_public_key_path) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **public\_key.pem** |

* This variable specifies the path name of the RSA public key file for the **caching\_sha2\_password** authentication plugin. If the file is named as a relative path, it is interpreted relative to the server data directory. The file must be in PEM format.
* For information about **caching\_sha2\_password**, including information about how clients request the RSA public key, see [Section 6.4.1.2, “Caching SHA-2 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#caching-sha2-pluggable-authentication).

* **[character\_set\_client](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_client)**

|  |  |
| --- | --- |
| **System Variable** | [**character\_set\_client**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_client) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **utf8mb4** |

* The character set for statements that arrive from the client. The session value of this variable is set using the character set requested by the client when the client connects to the server. (Many clients support a --default-character-set option to enable this character set to be specified explicitly. See also [Section 10.4, “Connection Character Sets and Collations”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#charset-connection).) The global value of the variable is used to set the session value in cases when the client-requested value is unknown or not available, or the server is configured to ignore client requests:
  + The client requests a character set not known to the server. For example, a Japanese-enabled client requests **sjis** when connecting to a server not configured with **sjis** support.
  + The client is from a version of MySQL older than MySQL 4.1, and thus does not request a character set.
  + [**mysqld**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysqld) was started with the [--skip-character-set-client-handshake](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_character-set-client-handshake) option, which causes it to ignore client character set configuration. This reproduces MySQL 4.0 behavior and is useful should you wish to upgrade the server without upgrading all the clients.

Some character sets cannot be used as the client character set. Attempting to use them as the **[character\_set\_client](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_client)** value produces an error. See [Impermissible Client Character Sets](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#charset-connection-impermissible-client-charset).

* **[character\_set\_connection](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_connection)**

|  |  |
| --- | --- |
| **System Variable** | [**character\_set\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_connection) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **utf8mb4** |

* The character set used for literals specified without a character set introducer and for number-to-string conversion. For information about introducers, see [Section 10.3.8, “Character Set Introducers”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#charset-introducer).

* **[character\_set\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_database)**

|  |  |
| --- | --- |
| **System Variable** | [**character\_set\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_database) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **utf8mb4** |
| **Footnote** | This option is dynamic, but should be set only by server. You should not set this variable manually. |

* The character set used by the default database. The server sets this variable whenever the default database changes. If there is no default database, the variable has the same value as **[character\_set\_server](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_server)**.
* As of MySQL 8.0.14, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).
* The global **[character\_set\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_database)** and **[collation\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_database)** system variables are deprecated; expect them to be removed in a future version of MySQL.
* Assigning a value to the session **[character\_set\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_database)** and **[collation\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_database)** system variables is deprecated and assignments produce a warning. Expect the session variables to become read-only (and assignments to them to produce an error) in a future version of MySQL in which it remains possible to access the session variables to determine the database character set and collation for the default database.

* **[character\_set\_filesystem](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_filesystem)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--character-set-filesystem=name** |
| **System Variable** | [**character\_set\_filesystem**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_filesystem) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **binary** |

* The file system character set. This variable is used to interpret string literals that refer to file names, such as in the [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data) and [**SELECT ... INTO OUTFILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select-into) statements and the [**LOAD\_FILE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_load-file) function. Such file names are converted from **[character\_set\_client](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_client)** to **[character\_set\_filesystem](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_filesystem)** before the file opening attempt occurs. The default value is **binary**, which means that no conversion occurs. For systems on which multibyte file names are permitted, a different value may be more appropriate. For example, if the system represents file names using UTF-8, set **[character\_set\_filesystem](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_filesystem)** to **'utf8mb4'**.
* As of MySQL 8.0.14, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[character\_set\_results](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_results)**

|  |  |
| --- | --- |
| **System Variable** | [**character\_set\_results**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_results) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **utf8mb4** |

* The character set used for returning query results to the client. This includes result data such as column values, result metadata such as column names, and error messages.

* **[character\_set\_server](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_server)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--character-set-server=name** |
| **System Variable** | [**character\_set\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_server) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **utf8mb4** |

* The servers default character set. See [Section 10.15, “Character Set Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#charset-configuration). If you set this variable, you should also set **[collation\_server](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_server)** to specify the collation for the character set.

* **[character\_set\_system](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_system)**

|  |  |
| --- | --- |
| **System Variable** | [**character\_set\_system**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_system) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **utf8** |

* The character set used by the server for storing identifiers. The value is always **utf8**.

* **[character\_sets\_dir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_sets_dir)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--character-sets-dir=dir\_name** |
| **System Variable** | [**character\_sets\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_sets_dir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |

* The directory where character sets are installed. See [Section 10.15, “Character Set Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#charset-configuration).

* **[check\_proxy\_users](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_check_proxy_users)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--check-proxy-users[={OFF|ON}]** |
| **System Variable** | [**check\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_check_proxy_users) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Some authentication plugins implement proxy user mapping for themselves (for example, the PAM and Windows authentication plugins). Other authentication plugins do not support proxy users by default. Of these, some can request that the MySQL server itself map proxy users according to granted proxy privileges: **mysql\_native\_password**, **sha256\_password**.
* If the **[check\_proxy\_users](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_check_proxy_users)** system variable is enabled, the server performs proxy user mapping for any authentication plugins that make such a request. However, it may also be necessary to enable plugin-specific system variables to take advantage of server proxy user mapping support:
  + For the **mysql\_native\_password** plugin, enable **[mysql\_native\_password\_proxy\_users](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mysql_native_password_proxy_users)**.
  + For the **sha256\_password** plugin, enable [**sha256\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_proxy_users).

For information about user proxying, see [Section 6.2.18, “Proxy Users”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#proxy-users).

* **[collation\_connection](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_connection)**

|  |  |
| --- | --- |
| **System Variable** | [**collation\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_connection) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The collation of the connection character set. **[collation\_connection](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_connection)** is important for comparisons of literal strings. For comparisons of strings with column values, **[collation\_connection](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_connection)** does not matter because columns have their own collation, which has a higher collation precedence (see [Section 10.8.4, “Collation Coercibility in Expressions”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#charset-collation-coercibility)).

* **[collation\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_database)**

|  |  |
| --- | --- |
| **System Variable** | [**collation\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_database) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **utf8mb4\_0900\_ai\_ci** |
| **Footnote** | This option is dynamic, but should be set only by server. You should not set this variable manually. |

* The collation used by the default database. The server sets this variable whenever the default database changes. If there is no default database, the variable has the same value as **[collation\_server](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_server)**.
* As of MySQL 8.0.18, setting the session value of this system variable is no longer a restricted operation.
* The global **[character\_set\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_database)** and **[collation\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_database)** system variables are deprecated; expect them to be removed in a future version of MySQL.
* Assigning a value to the session **[character\_set\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_database)** and **[collation\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_database)** system variables is deprecated and assignments produce a warning. Expect the session variables to become read-only (and assignments to produce an error) in a future version of MySQL in which it remains possible to access the session variables to determine the database character set and collation for the default database.

* **[collation\_server](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_collation_server)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--collation-server=name** |
| **System Variable** | [**collation\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_server) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **utf8mb4\_0900\_ai\_ci** |

* The server's default collation. See [Section 10.15, “Character Set Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#charset-configuration).

* **[completion\_type](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_completion_type)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--completion-type=#** |
| **System Variable** | [**completion\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_completion_type) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **NO\_CHAIN** |
| **Valid Values** | **NO\_CHAIN**  **CHAIN**  **RELEASE**  **0**  **1**  **2** |

* The transaction completion type. This variable can take the values shown in the following table. The variable can be assigned using either the name values or corresponding integer values.

| **Value** | **Description** |
| --- | --- |
| **NO\_CHAIN** (or 0) | [**COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) and [**ROLLBACK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) are unaffected. This is the default value. |
| **CHAIN** (or 1) | [**COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) and [**ROLLBACK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) are equivalent to **COMMIT AND CHAIN** and **ROLLBACK AND CHAIN**, respectively. (A new transaction starts immediately with the same isolation level as the just-terminated transaction.) |
| **RELEASE** (or 2) | [**COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) and [**ROLLBACK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) are equivalent to **COMMIT RELEASE** and **ROLLBACK RELEASE**, respectively. (The server disconnects after terminating the transaction.) |

* [**completion\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_completion_type) affects transactions that begin with [**START TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) or [**BEGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) and end with [**COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) or [**ROLLBACK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit). It does not apply to implicit commits resulting from execution of the statements listed in [Section 13.3.3, “Statements That Cause an Implicit Commit”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#implicit-commit). It also does not apply for [**XA COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#xa-statements), [**XA ROLLBACK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#xa-statements), or when **[autocommit=1](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_autocommit)**.

* **[concurrent\_insert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_concurrent_insert)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--concurrent-insert[=value]** |
| **System Variable** | [**concurrent\_insert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_concurrent_insert) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **AUTO** |
| **Valid Values** | **NEVER**  **AUTO**  **ALWAYS**  **0**  **1**  **2** |

* If **AUTO** (the default), MySQL permits [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert) and [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements to run concurrently for **MyISAM** tables that have no free blocks in the middle of the data file.
* This variable can take the values shown in the following table. The variable can be assigned using either the name values or corresponding integer values.

| **Value** | **Description** |
| --- | --- |
| **NEVER** (or 0) | Disables concurrent inserts |
| **AUTO** (or 1) | (Default) Enables concurrent insert for **MyISAM** tables that do not have holes |
| **ALWAYS** (or 2) | Enables concurrent inserts for all **MyISAM** tables, even those that have holes. For a table with a hole, new rows are inserted at the end of the table if it is in use by another thread. Otherwise, MySQL acquires a normal write lock and inserts the row into the hole. |

* If you start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with [--skip-new](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-new), **[concurrent\_insert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_concurrent_insert)** is set to **NEVER**.
* See also [Section 8.11.3, “Concurrent Inserts”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#concurrent-inserts).

* **[connect\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_connect_timeout)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--connect-timeout=#** |
| **System Variable** | [**connect\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_connect_timeout) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **10** |
| **Minimum Value** | **2** |
| **Maximum Value** | **31536000** |

* The number of seconds that the **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** server waits for a connect packet before responding with **Bad handshake**. The default value is 10 seconds.
* Increasing the **[connect\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_connect_timeout)** value might help if clients frequently encounter errors of the form **Lost connection to MySQL server at '*XXX*', system error: *errno***.

* **[core\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_core_file)**

|  |  |
| --- | --- |
| **System Variable** | [**core\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_core_file) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether to write a core file if the server unexpectedly exits. This variable is set by the [--core-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_core-file) option.

* **[create\_admin\_listener\_thread](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_create_admin_listener_thread)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--create-admin-listener-thread[={OFF|ON}]** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**create\_admin\_listener\_thread**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_create_admin_listener_thread) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether to use a dedicated listening thread for client connections on the administrative network interface (see [Section 5.1.12.1, “Connection Interfaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces)). The default is **OFF**; that is, the manager thread for ordinary connections on the main interface also handles connections for the administrative interface.
* Depending on factors such as platform type and workload, you may find one setting for this variable yields better performance than the other setting.
* Setting **[create\_admin\_listener\_thread](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_create_admin_listener_thread)** has no effect if **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** is not specified because in that case the server maintains no administrative network interface.

* **[cte\_max\_recursion\_depth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_cte_max_recursion_depth)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--cte-max-recursion-depth=#** |
| **System Variable** | [**cte\_max\_recursion\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_cte_max_recursion_depth) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1000** |
| **Minimum Value** | **0** |
| **Maximum Value** | **4294967295** |

* The common table expression (CTE) maximum recursion depth. The server terminates execution of any CTE that recurses more levels than the value of this variable. For more information, see [Limiting Common Table Expression Recursion](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#common-table-expressions-recursion-limits).

* **[datadir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_datadir)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--datadir=dir\_name** |
| **System Variable** | [**datadir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_datadir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |

* The path to the MySQL server data directory. Relative paths are resolved with respect to the current directory. If you expect the server to be started automatically (that is, in contexts for which you cannot know the current directory in advance), it is best to specify the **[datadir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_datadir)** value as an absolute path.

* **[debug](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_debug)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--debug[=debug\_options]** |
| **System Variable** | [**debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value (Unix)** | **d:t:i:o,/tmp/mysqld.trace** |
| **Default Value (Windows)** | **d:t:i:O,\mysqld.trace** |

* This variable indicates the current debugging settings. It is available only for servers built with debugging support. The initial value comes from the value of instances of the [--debug](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_debug) option given at server startup. The global and session values may be set at runtime.
* Setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).
* Assigning a value that begins with **+** or **-** cause the value to added to or subtracted from the current value:
* mysql> **SET debug = 'T';**
* mysql> **SELECT @@debug;**
* +---------+
* | @@debug |
* +---------+
* | T |
* +---------+
* mysql> **SET debug = '+P';**
* mysql> **SELECT @@debug;**
* +---------+
* | @@debug |
* +---------+
* | P:T |
* +---------+
* mysql> **SET debug = '-P';**
* mysql> **SELECT @@debug;**
* +---------+
* | @@debug |
* +---------+
* | T |
* +---------+
* For more information, see [Section 5.9.4, “The DBUG Package”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#dbug-package).

* **[debug\_sync](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_debug_sync)**

|  |  |
| --- | --- |
| **System Variable** | [**debug\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug_sync) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* This variable is the user interface to the Debug Sync facility. Use of Debug Sync requires that MySQL be configured with the [-DENABLE\_DEBUG\_SYNC=1](https://dev.mysql.com/doc/refman/5.6/en/source-configuration-options.html#option_cmake_enable_debug_sync) **CMake** option (see [Section 2.9.7, “MySQL Source-Configuration Options”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#source-configuration-options)). If Debug Sync is not compiled in, this system variable is not available.
* The global variable value is read only and indicates whether the facility is enabled. By default, Debug Sync is disabled and the value of **[debug\_sync](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_debug_sync)** is **OFF**. If the server is started with [--debug-sync-timeout=***N***](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_debug-sync-timeout), where ***N*** is a timeout value greater than 0, Debug Sync is enabled and the value of **[debug\_sync](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_debug_sync)** is **ON - current signal** followed by the signal name. Also, ***N*** becomes the default timeout for individual synchronization points.
* The session value can be read by any user and has the same value as the global variable. The session value can be set to control synchronization points.
* Setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).
* For a description of the Debug Sync facility and how to use synchronization points, see [MySQL Internals: Test Synchronization](https://dev.mysql.com/doc/internals/en/test-synchronization.html).

* **[default\_authentication\_plugin](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_authentication_plugin)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--default-authentication-plugin=plugin\_name** |
| **System Variable** | [**default\_authentication\_plugin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_authentication_plugin) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **caching\_sha2\_password** |
| **Valid Values** | **mysql\_native\_password**  **sha256\_password**  **caching\_sha2\_password** |

* The default authentication plugin. These values are permitted:
  + **mysql\_native\_password**: Use MySQL native passwords; see [Section 6.4.1.1, “Native Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#native-pluggable-authentication).
  + **sha256\_password**: Use SHA-256 passwords; see [Section 6.4.1.3, “SHA-256 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sha256-pluggable-authentication).
  + **caching\_sha2\_password**: Use SHA-256 passwords; see [Section 6.4.1.2, “Caching SHA-2 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#caching-sha2-pluggable-authentication).

**Note**

In MySQL 8.0, **caching\_sha2\_password** is the default authentication plugin rather than **mysql\_native\_password**. For information about the implications of this change for server operation and compatibility of the server with clients and connectors, see [caching\_sha2\_password as the Preferred Authentication Plugin](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#upgrade-caching-sha2-password).

The **[default\_authentication\_plugin](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_authentication_plugin)** value affects these aspects of server operation:

* + It determines which authentication plugin the server assigns to new accounts created by [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user) and [**GRANT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#grant) statements that do not explicitly specify an authentication plugin.
  + For an account created with the following statement, the server associates the account with the default authentication plugin and assigns the account the given password, hashed as required by that plugin:
  + CREATE USER ... IDENTIFIED BY '***cleartext password***';

* **[default\_collation\_for\_utf8mb4](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_collation_for_utf8mb4)**

|  |  |
| --- | --- |
| **System Variable** | [**default\_collation\_for\_utf8mb4**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_collation_for_utf8mb4) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Valid Values** | **utf8mb4\_0900\_ai\_ci**  **utf8mb4\_general\_ci** |

* For internal use by replication. This system variable is set to the default collation for the **utf8mb4** character set. The value of the variable is replicated from a source to a replica so that the replica can correctly process data originating from a source with a different default collation for **utf8mb4**. This variable is primarily intended to support replication from a MySQL 5.7 or older replication source server to a MySQL 8.0 replica server, or group replication with a MySQL 5.7 primary node and one or more MySQL 8.0 secondaries. The default collation for **utf8mb4** in MySQL 5.7 is **utf8mb4\_general\_ci**, but **utf8mb4\_0900\_ai\_ci** in MySQL 8.0. The variable is not present in releases earlier than MySQL 8.0, so if the replica does not receive a value for the variable, it assumes the source is from an earlier release and sets the value to the previous default collation **utf8mb4\_general\_ci**.
* As of MySQL 8.0.18, setting the session value of this system variable is no longer a restricted operation.
* The default **utf8mb4** collation is used in the following statements:
  + [**SHOW COLLATION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-collation) and [**SHOW CHARACTER SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-character-set).
  + [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) and [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) having a **CHARACTER SET utf8mb4** clause without a **COLLATION** clause, either for the table character set or for a column character set.
  + [**CREATE DATABASE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-database) and [**ALTER DATABASE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-database) having a **CHARACTER SET utf8mb4** clause without a **COLLATION** clause.
  + Any statement containing a string literal of the form **\_utf8mb4'*some text*'** without a **COLLATE** clause.

* **[default\_password\_lifetime](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_password_lifetime)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--default-password-lifetime=#** |
| **System Variable** | [**default\_password\_lifetime**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_password_lifetime) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **65535** |

* This variable defines the global automatic password expiration policy. The default **[default\_password\_lifetime](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_password_lifetime)** value is 0, which disables automatic password expiration. If the value of **[default\_password\_lifetime](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_password_lifetime)** is a positive integer ***N***, it indicates the permitted password lifetime; passwords must be changed every ***N*** days.
* The global password expiration policy can be overridden as desired for individual accounts using the password expiration option of the [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user) and [**ALTER USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-user) statements. See [Section 6.2.15, “Password Management”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#password-management).

* **[default\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_storage_engine)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--default-storage-engine=name** |
| **System Variable** | [**default\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_storage_engine) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **InnoDB** |

* The default storage engine for tables. See [Chapter 16, *Alternative Storage Engines*](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\storage-engines.html). This variable sets the storage engine for permanent tables only. To set the storage engine for **TEMPORARY** tables, set the **[default\_tmp\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_tmp_storage_engine)** system variable.
* To see which storage engines are available and enabled, use the [**SHOW ENGINES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-engines) statement or query the **INFORMATION\_SCHEMA** [**ENGINES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-engines-table) table.
* If you disable the default storage engine at server startup, you must set the default engine for both permanent and **TEMPORARY** tables to a different engine, or else the server does not start.

* **[default\_table\_encryption](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_table_encryption)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--default-table-encryption[={OFF|ON}]** |
| **Introduced** | 8.0.16 |
| **System Variable** | [**default\_table\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_table_encryption) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Defines the default encryption setting applied to schemas and general tablespaces when they are created without specifying an **ENCRYPTION** clause.
* The **[default\_table\_encryption](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_table_encryption)** variable is only applicable to user-created schemas and general tablespaces. It does not govern encryption of the **mysql** system tablespace.
* Setting the runtime value of **[default\_table\_encryption](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_table_encryption)** requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) and [**TABLE\_ENCRYPTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_table-encryption-admin) privileges, or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege.
* [**default\_table\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_table_encryption) supports [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) and [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) syntax. See [Section 5.1.9.3, “Persisted System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables).
* For more information, see [Defining an Encryption Default for Schemas and General Tablespaces](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-schema-tablespace-encryption-default).

* **[default\_tmp\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_tmp_storage_engine)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--default-tmp-storage-engine=name** |
| **System Variable** | [**default\_tmp\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_tmp_storage_engine) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Enumeration |
| **Default Value** | **InnoDB** |

* The default storage engine for **TEMPORARY** tables (created with [**CREATE TEMPORARY TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table)). To set the storage engine for permanent tables, set the **[default\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_storage_engine)** system variable. Also see the discussion of that variable regarding possible values.
* If you disable the default storage engine at server startup, you must set the default engine for both permanent and **TEMPORARY** tables to a different engine, or else the server does not start.

* **[default\_week\_format](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_week_format)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--default-week-format=#** |
| **System Variable** | [**default\_week\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_week_format) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **7** |

* The default mode value to use for the [**WEEK()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_week) function. See [Section 12.7, “Date and Time Functions”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#date-and-time-functions).

* **[delay\_key\_write](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_delay_key_write)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--delay-key-write[={OFF|ON|ALL}]** |
| **System Variable** | [**delay\_key\_write**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delay_key_write) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **ON** |
| **Valid Values** | **ON**  **OFF**  **ALL** |

* This variable specifies how to use delayed key writes. It applies only to **MyISAM** tables. Delayed key writing causes key buffers not to be flushed between writes. See also [Section 16.2.1, “MyISAM Startup Options”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\storage-engines.html#myisam-start).
* This variable can have one of the following values to affect handling of the **DELAY\_KEY\_WRITE** table option that can be used in [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) statements.

| **Option** | **Description** |
| --- | --- |
| **OFF** | **DELAY\_KEY\_WRITE** is ignored. |
| **ON** | MySQL honors any **DELAY\_KEY\_WRITE** option specified in [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) statements. This is the default value. |
| **ALL** | All new opened tables are treated as if they were created with the **DELAY\_KEY\_WRITE** option enabled. |

* **Note**
* If you set this variable to **ALL**, you should not use **MyISAM** tables from within another program (such as another MySQL server or **[myisamchk](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "myisamchk" \o "4.6.4 myisamchk — MyISAM Table-Maintenance Utility)**) when the tables are in use. Doing so leads to index corruption.
* If **DELAY\_KEY\_WRITE** is enabled for a table, the key buffer is not flushed for the table on every index update, but only when the table is closed. This speeds up writes on keys a lot, but if you use this feature, you should add automatic checking of all **MyISAM** tables by starting the server with the **[myisam\_recover\_options](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_recover_options)** system variable set (for example, **myisam\_recover\_options='BACKUP,FORCE'**). See [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables), and [Section 16.2.1, “MyISAM Startup Options”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\storage-engines.html#myisam-start).
* If you start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with [--skip-new](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-new), **[delay\_key\_write](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_delay_key_write)** is set to **OFF**.
* **Warning**
* If you enable external locking with [--external-locking](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_external-locking), there is no protection against index corruption for tables that use delayed key writes.

* **[delayed\_insert\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_delayed_insert_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--delayed-insert-limit=#** |
| **Deprecated** | Yes |
| **System Variable** | [**delayed\_insert\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_insert_limit) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **100** |
| **Minimum Value** | **1** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* This system variable is deprecated (because **DELAYED** inserts are not supported), and you should expect it to be removed in a future release.

* **[delayed\_insert\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_delayed_insert_timeout)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--delayed-insert-timeout=#** |
| **Deprecated** | Yes |
| **System Variable** | [**delayed\_insert\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_insert_timeout) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **300** |

* This system variable is deprecated (because **DELAYED** inserts are not supported), and you should expect it to be removed in a future release.

* **[delayed\_queue\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_delayed_queue_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--delayed-queue-size=#** |
| **Deprecated** | Yes |
| **System Variable** | [**delayed\_queue\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_queue_size) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1000** |
| **Minimum Value** | **1** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* This system variable is deprecated (because **DELAYED** inserts are not supported), and you should expect it to be removed in a future release.

* **[disabled\_storage\_engines](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_disabled_storage_engines)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--disabled-storage-engines=engine[,engine]...** |
| **System Variable** | [**disabled\_storage\_engines**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_disabled_storage_engines) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **empty string** |

* This variable indicates which storage engines cannot be used to create tables or tablespaces. For example, to prevent new **MyISAM** or **FEDERATED** tables from being created, start the server with these lines in the server option file:
* [mysqld]
* disabled\_storage\_engines="MyISAM,FEDERATED"
* By default, **[disabled\_storage\_engines](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_disabled_storage_engines)** is empty (no engines disabled), but it can be set to a comma-separated list of one or more engines (not case-sensitive). Any engine named in the value cannot be used to create tables or tablespaces with [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) or [**CREATE TABLESPACE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-tablespace), and cannot be used with [**ALTER TABLE ... ENGINE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) or [**ALTER TABLESPACE ... ENGINE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-tablespace) to change the storage engine of existing tables or tablespaces. Attempts to do so result in an [**ER\_DISABLED\_STORAGE\_ENGINE**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_disabled_storage_engine) error.
* [**disabled\_storage\_engines**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_disabled_storage_engines) does not restrict other DDL statements for existing tables, such as [**CREATE INDEX**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-index), [**TRUNCATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#truncate-table), [**ANALYZE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#analyze-table), [**DROP TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-table), or [**DROP TABLESPACE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-tablespace). This permits a smooth transition so that existing tables or tablespaces that use a disabled engine can be migrated to a permitted engine by means such as [**ALTER TABLE ... ENGINE *permitted\_engine***](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table).
* It is permitted to set the **[default\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_storage_engine)** or **[default\_tmp\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_tmp_storage_engine)** system variable to a storage engine that is disabled. This could cause applications to behave erratically or fail, although that might be a useful technique in a development environment for identifying applications that use disabled engines, so that they can be modified.
* [**disabled\_storage\_engines**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_disabled_storage_engines) is disabled and has no effect if the server is started with any of these options: [--initialize](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_initialize), [--initialize-insecure](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_initialize-insecure), [--skip-grant-tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-grant-tables).
* **Note**
* Setting **[disabled\_storage\_engines](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_disabled_storage_engines)** might cause an issue with **[mysql\_upgrade](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql-upgrade" \o "4.4.5 mysql_upgrade — Check and Upgrade MySQL Tables)**. For details, see [Section 4.4.5, “mysql\_upgrade — Check and Upgrade MySQL Tables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysql-upgrade).

* **[disconnect\_on\_expired\_password](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_disconnect_on_expired_password)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--disconnect-on-expired-password[={OFF|ON}]** |
| **System Variable** | [**disconnect\_on\_expired\_password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_disconnect_on_expired_password) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* This variable controls how the server handles clients with expired passwords:
  + If the client indicates that it can handle expired passwords, the value of **[disconnect\_on\_expired\_password](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_disconnect_on_expired_password)** is irrelevant. The server permits the client to connect but puts it in sandbox mode.
  + If the client does not indicate that it can handle expired passwords, the server handles the client according to the value of **[disconnect\_on\_expired\_password](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_disconnect_on_expired_password)**:
    - If **[disconnect\_on\_expired\_password](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_disconnect_on_expired_password)**: is enabled, the server disconnects the client.
    - If **[disconnect\_on\_expired\_password](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_disconnect_on_expired_password)**: is disabled, the server permits the client to connect but puts it in sandbox mode.

For more information about the interaction of client and server settings relating to expired-password handling, see [Section 6.2.16, “Server Handling of Expired Passwords”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#expired-password-handling).

* **[div\_precision\_increment](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_div_precision_increment)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--div-precision-increment=#** |
| **System Variable** | [**div\_precision\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_div_precision_increment) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **4** |
| **Minimum Value** | **0** |
| **Maximum Value** | **30** |

* This variable indicates the number of digits by which to increase the scale of the result of division operations performed with the [**/**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_divide) operator. The default value is 4. The minimum and maximum values are 0 and 30, respectively. The following example illustrates the effect of increasing the default value.
* mysql> **SELECT 1/7;**
* +--------+
* | 1/7 |
* +--------+
* | 0.1429 |
* +--------+
* mysql> **SET div\_precision\_increment = 12;**
* mysql> **SELECT 1/7;**
* +----------------+
* | 1/7 |
* +----------------+
* | 0.142857142857 |
* +----------------+

* **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--dragnet.log-error-filter-rules=value** |
| **System Variable** | [**dragnet.log\_error\_filter\_rules**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_dragnet.log_error_filter_rules) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **IF prio>=INFORMATION THEN drop. IF EXISTS source\_line THEN unset source\_line.** |

* The filter rules that control operation of the **log\_filter\_dragnet** error log filter component. If **log\_filter\_dragnet** is not installed, **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)** is unavailable. If **log\_filter\_dragnet** is installed but not enabled, changes to **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)** have no effect.
* The effect of the default value is similar to the filtering performed by the **log\_sink\_internal** filter with a setting of **[log\_error\_verbosity=2](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)**.
* As of MySQL 8.0.12, the **[dragnet.Status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_dragnet.Status)** status variable can be consulted to determine the result of the most recent assignment to **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)**.
* Prior to MySQL 8.0.12, successful assignments to **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)** at runtime produce a note confirming the new value:
* mysql> **SET GLOBAL dragnet.log\_error\_filter\_rules = 'IF prio <> 0 THEN unset prio.';**
* Query OK, 0 rows affected, 1 warning (0.00 sec)
* mysql> **SHOW WARNINGS\G**
* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
* Level: Note
* Code: 4569
* Message: filter configuration accepted:
* SET @@GLOBAL.dragnet.log\_error\_filter\_rules=
* 'IF prio!=ERROR THEN unset prio.';
* The value displayed by [**SHOW WARNINGS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-warnings) indicates the “decompiled” canonical representation after the rule set has been successfully parsed and compiled into internal form. Semantically, this canonical form is identical to the value assigned to **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)**, but there may be some differences between the assigned and canonical values, as illustrated by the preceding example:
  + The **<>** operator is changed to **!=**.
  + The numeric priority of 0 is changed to the corresponding priority symbol **ERROR**.
  + Optional spaces are removed.

For additional information, see [Section 5.4.2.4, “Types of Error Log Filtering”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-filtering), and [Section 5.5.3, “Error Log Components”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-components).

* **[end\_markers\_in\_json](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_end_markers_in_json)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--end-markers-in-json[={OFF|ON}]** |
| **System Variable** | [**end\_markers\_in\_json**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_end_markers_in_json) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether optimizer JSON output should add end markers. See [MySQL Internals: The end\_markers\_in\_json System Variable](https://dev.mysql.com/doc/internals/en/end-markers-in-json-system-variable.html).

* **[eq\_range\_index\_dive\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_eq_range_index_dive_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--eq-range-index-dive-limit=#** |
| **System Variable** | [**eq\_range\_index\_dive\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_eq_range_index_dive_limit) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **200** |
| **Minimum Value** | **0** |
| **Maximum Value** | **4294967295** |

* This variable indicates the number of equality ranges in an equality comparison condition when the optimizer should switch from using index dives to index statistics in estimating the number of qualifying rows. It applies to evaluation of expressions that have either of these equivalent forms, where the optimizer uses a nonunique index to look up ***col\_name*** values:
* ***col\_name*** IN(***val1***, ..., ***valN***)
* ***col\_name*** = ***val1*** OR ... OR ***col\_name*** = ***valN***
* In both cases, the expression contains ***N*** equality ranges. The optimizer can make row estimates using index dives or index statistics. If **[eq\_range\_index\_dive\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_eq_range_index_dive_limit)** is greater than 0, the optimizer uses existing index statistics instead of index dives if there are **[eq\_range\_index\_dive\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_eq_range_index_dive_limit)** or more equality ranges. Thus, to permit use of index dives for up to ***N*** equality ranges, set **[eq\_range\_index\_dive\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_eq_range_index_dive_limit)** to ***N*** + 1. To disable use of index statistics and always use index dives regardless of ***N***, set **[eq\_range\_index\_dive\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_eq_range_index_dive_limit)** to 0.
* For more information, see [Equality Range Optimization of Many-Valued Comparisons](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#equality-range-optimization).
* To update table index statistics for best estimates, use [**ANALYZE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#analyze-table).

* **[error\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_error_count)**

The number of errors that resulted from the last statement that generated messages. This variable is read only. See [Section 13.7.7.17, “SHOW ERRORS Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-errors).

* **[event\_scheduler](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_event_scheduler)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--event-scheduler[=value]** |
| **System Variable** | [**event\_scheduler**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_event_scheduler) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **ON** |
| **Valid Values** | **ON**  **OFF**  **DISABLED** |

* This variable enables or disables, and starts or stops, the Event Scheduler. The possible status values are **ON**, **OFF**, and **DISABLED**, with the default being **OFF**. Turning the Event Scheduler **OFF** is not the same as disabling the Event Scheduler, which requires setting the status to **DISABLED**. This variable and its effects on the Event Scheduler's operation are discussed in greater detail in [Section 25.4.2, “Event Scheduler Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\stored-objects.html#events-configuration)

* **[explicit\_defaults\_for\_timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_explicit_defaults_for_timestamp)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--explicit-defaults-for-timestamp[={OFF|ON}]** |
| **Deprecated** | Yes |
| **System Variable** | [**explicit\_defaults\_for\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_explicit_defaults_for_timestamp) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* This system variable determines whether the server enables certain nonstandard behaviors for default values and **NULL**-value handling in [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns. By default, **[explicit\_defaults\_for\_timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_explicit_defaults_for_timestamp)** is enabled, which disables the nonstandard behaviors. Disabling **[explicit\_defaults\_for\_timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_explicit_defaults_for_timestamp)** results in a warning.
* As of MySQL 8.0.18, setting the session value of this system variable is no longer a restricted operation.
* If **[explicit\_defaults\_for\_timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_explicit_defaults_for_timestamp)** is disabled, the server enables the nonstandard behaviors and handles [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns as follows:
  + [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns not explicitly declared with the **NULL** attribute are automatically declared with the **NOT NULL** attribute. Assigning such a column a value of **NULL** is permitted and sets the column to the current timestamp. Exception: As of MySQL 8.0.22, attempting to insert **NULL** into a generated column declared as **TIMESTAMP NOT NULL** is rejected with an error.
  + The first [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) column in a table, if not explicitly declared with the **NULL** attribute or an explicit **DEFAULT** or **ON UPDATE** attribute, is automatically declared with the **DEFAULT CURRENT\_TIMESTAMP** and **ON UPDATE CURRENT\_TIMESTAMP** attributes.
  + [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns following the first one, if not explicitly declared with the **NULL** attribute or an explicit **DEFAULT** attribute, are automatically declared as **DEFAULT '0000-00-00 00:00:00'** (the “zero” timestamp). For inserted rows that specify no explicit value for such a column, the column is assigned **'0000-00-00 00:00:00'** and no warning occurs.

Depending on whether strict SQL mode or the [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date) SQL mode is enabled, a default value of **'0000-00-00 00:00:00'** may be invalid. Be aware that the [**TRADITIONAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_traditional) SQL mode includes strict mode and [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date). See [Section 5.1.11, “Server SQL Modes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode).

* The nonstandard behaviors just described are deprecated; expect them to be removed in a future MySQL release.
* If **[explicit\_defaults\_for\_timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_explicit_defaults_for_timestamp)** is enabled, the server disables the nonstandard behaviors and handles [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns as follows:
  + It is not possible to assign a [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) column a value of **NULL** to set it to the current timestamp. To assign the current timestamp, set the column to [**CURRENT\_TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_current-timestamp) or a synonym such as [**NOW()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_now).
  + [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns not explicitly declared with the **NOT NULL** attribute are automatically declared with the **NULL** attribute and permit **NULL** values. Assigning such a column a value of **NULL** sets it to **NULL**, not the current timestamp.
  + [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns declared with the **NOT NULL** attribute do not permit **NULL** values. For inserts that specify **NULL** for such a column, the result is either an error for a single-row insert if strict SQL mode is enabled, or **'0000-00-00 00:00:00'** is inserted for multiple-row inserts with strict SQL mode disabled. In no case does assigning the column a value of **NULL** set it to the current timestamp.
  + [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns explicitly declared with the **NOT NULL** attribute and without an explicit **DEFAULT** attribute are treated as having no default value. For inserted rows that specify no explicit value for such a column, the result depends on the SQL mode. If strict SQL mode is enabled, an error occurs. If strict SQL mode is not enabled, the column is declared with the implicit default of **'0000-00-00 00:00:00'** and a warning occurs. This is similar to how MySQL treats other temporal types such as [**DATETIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime).
  + No [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) column is automatically declared with the **DEFAULT CURRENT\_TIMESTAMP** or **ON UPDATE CURRENT\_TIMESTAMP** attributes. Those attributes must be explicitly specified.
  + The first [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) column in a table is not handled differently from [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns following the first one.

If **[explicit\_defaults\_for\_timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_explicit_defaults_for_timestamp)** is disabled at server startup, this warning appears in the error log:

[Warning] TIMESTAMP with implicit DEFAULT value is deprecated.

Please use --explicit\_defaults\_for\_timestamp server option (see

documentation for more details).

As indicated by the warning, to disable the deprecated nonstandard behaviors, enable the **[explicit\_defaults\_for\_timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_explicit_defaults_for_timestamp)** system variable at server startup.

**Note**

[**explicit\_defaults\_for\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_explicit_defaults_for_timestamp) is itself deprecated because its only purpose is to permit control over deprecated [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) behaviors that are to be removed in a future MySQL release. When removal of those behaviors occurs, expect **[explicit\_defaults\_for\_timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_explicit_defaults_for_timestamp)** to be removed as well.

For additional information, see [Section 11.2.5, “Automatic Initialization and Updating for TIMESTAMP and DATETIME”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#timestamp-initialization).

* **[external\_user](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_external_user)**

|  |  |
| --- | --- |
| **System Variable** | [**external\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_external_user) |
| **Scope** | Session |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The external user name used during the authentication process, as set by the plugin used to authenticate the client. With native (built-in) MySQL authentication, or if the plugin does not set the value, this variable is **NULL**. See [Section 6.2.18, “Proxy Users”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#proxy-users).

* **[flush](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_flush)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--flush[={OFF|ON}]** |
| **System Variable** | [**flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If **ON**, the server flushes (synchronizes) all changes to disk after each SQL statement. Normally, MySQL does a write of all changes to disk only after each SQL statement and lets the operating system handle the synchronizing to disk. See [Section B.3.3.3, “What to Do If MySQL Keeps Crashing”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#crashing). This variable is set to **ON** if you start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with the [--flush](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_flush) option.
* **Note**
* If [**flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush) is enabled, the value of **[flush\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_flush_time)** does not matter and changes to **[flush\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_flush_time)** have no effect on flush behavior.

* **[flush\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_flush_time)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--flush-time=#** |
| **System Variable** | [**flush\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush_time) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |

* If this is set to a nonzero value, all tables are closed every **[flush\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_flush_time)** seconds to free up resources and synchronize unflushed data to disk. This option is best used only on systems with minimal resources.
* **Note**
* If [**flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush) is enabled, the value of **[flush\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_flush_time)** does not matter and changes to **[flush\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_flush_time)** have no effect on flush behavior.

* **[foreign\_key\_checks](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_foreign_key_checks)**

|  |  |
| --- | --- |
| **System Variable** | [**foreign\_key\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_foreign_key_checks) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **ON** |

* If set to 1 (the default), foreign key constraints are checked. If set to 0, foreign key constraints are ignored, with a couple of exceptions. When re-creating a table that was dropped, an error is returned if the table definition does not conform to the foreign key constraints referencing the table. Likewise, an [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) operation returns an error if a foreign key definition is incorrectly formed. For more information, see [Section 13.1.20.5, “FOREIGN KEY Constraints”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table-foreign-keys).
* Setting this variable has the same effect on [**NDB**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html) tables as it does for **InnoDB** tables. Typically you leave this setting enabled during normal operation, to enforce [referential integrity](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_referential_integrity). Disabling foreign key checking can be useful for reloading **InnoDB** tables in an order different from that required by their parent/child relationships. See [Section 13.1.20.5, “FOREIGN KEY Constraints”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table-foreign-keys).
* Setting **foreign\_key\_checks** to 0 also affects data definition statements: [**DROP SCHEMA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-database) drops a schema even if it contains tables that have foreign keys that are referred to by tables outside the schema, and [**DROP TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-table) drops tables that have foreign keys that are referred to by other tables.
* **Note**
* Setting **foreign\_key\_checks** to 1 does not trigger a scan of the existing table data. Therefore, rows added to the table while **[foreign\_key\_checks = 0](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_foreign_key_checks)** are not verified for consistency.
* Dropping an index required by a foreign key constraint is not permitted, even with **[foreign\_key\_checks=0](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_foreign_key_checks)**. The foreign key constraint must be removed before dropping the index.

* **[ft\_boolean\_syntax](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ft_boolean_syntax)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ft-boolean-syntax=name** |
| **System Variable** | [**ft\_boolean\_syntax**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_boolean_syntax) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **+ -><()~\*:""&|** |

* The list of operators supported by boolean full-text searches performed using **IN BOOLEAN MODE**. See [Section 12.10.2, “Boolean Full-Text Searches”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#fulltext-boolean).
* The default variable value is **'+ -><()~\*:""&|'**. The rules for changing the value are as follows:
  + Operator function is determined by position within the string.
  + The replacement value must be 14 characters.
  + Each character must be an ASCII nonalphanumeric character.
  + Either the first or second character must be a space.
  + No duplicates are permitted except the phrase quoting operators in positions 11 and 12. These two characters are not required to be the same, but they are the only two that may be.
  + Positions 10, 13, and 14 (which by default are set to **:**, **&**, and **|**) are reserved for future extensions.

* **[ft\_max\_word\_len](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ft_max_word_len)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ft-max-word-len=#** |
| **System Variable** | [**ft\_max\_word\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_max_word_len) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Minimum Value** | **10** |

* The maximum length of the word to be included in a **MyISAM** **FULLTEXT** index.
* **Note**
* **FULLTEXT** indexes on **MyISAM** tables must be rebuilt after changing this variable. Use **REPAIR TABLE *tbl\_name* QUICK**.

* **[ft\_min\_word\_len](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ft_min_word_len)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ft-min-word-len=#** |
| **System Variable** | [**ft\_min\_word\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_min_word_len) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **4** |
| **Minimum Value** | **1** |

* The minimum length of the word to be included in a **MyISAM** **FULLTEXT** index.
* **Note**
* **FULLTEXT** indexes on **MyISAM** tables must be rebuilt after changing this variable. Use **REPAIR TABLE *tbl\_name* QUICK**.

* **[ft\_query\_expansion\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ft_query_expansion_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ft-query-expansion-limit=#** |
| **System Variable** | [**ft\_query\_expansion\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_query_expansion_limit) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **20** |
| **Minimum Value** | **0** |
| **Maximum Value** | **1000** |

* The number of top matches to use for full-text searches performed using **WITH QUERY EXPANSION**.

* **[ft\_stopword\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ft_stopword_file)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ft-stopword-file=file\_name** |
| **System Variable** | [**ft\_stopword\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_stopword_file) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |

* The file from which to read the list of stopwords for full-text searches on **MyISAM** tables. The server looks for the file in the data directory unless an absolute path name is given to specify a different directory. All the words from the file are used; comments are not honored. By default, a built-in list of stopwords is used (as defined in the storage/myisam/ft\_static.c file). Setting this variable to the empty string (**''**) disables stopword filtering. See also [Section 12.10.4, “Full-Text Stopwords”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#fulltext-stopwords).
* **Note**
* **FULLTEXT** indexes on **MyISAM** tables must be rebuilt after changing this variable or the contents of the stopword file. Use **REPAIR TABLE *tbl\_name* QUICK**.

* **[general\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--general-log[={OFF|ON}]** |
| **System Variable** | [**general\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the general query log is enabled. The value can be 0 (or **OFF**) to disable the log or 1 (or **ON**) to enable the log. The destination for log output is controlled by the **[log\_output](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_output)** system variable; if that value is **NONE**, no log entries are written even if the log is enabled.

* **[general\_log\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log_file)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--general-log-file=file\_name** |
| **System Variable** | [**general\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log_file) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **host\_name.log** |

* The name of the general query log file. The default value is ***host\_name***.log, but the initial value can be changed with the [--general\_log\_file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log_file) option.

* **[generated\_random\_password\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_generated_random_password_length)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--generated-random-password-length=#** |
| **Introduced** | 8.0.18 |
| **System Variable** | [**generated\_random\_password\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_generated_random_password_length) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **20** |
| **Minimum Value** | **5** |
| **Maximum Value** | **255** |

* The maximum number of characters permitted in random passwords generated for [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user), [**ALTER USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-user), and [**SET PASSWORD**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-password) statements. For more information, see [Random Password Generation](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#random-password-generation).

* **[group\_concat\_max\_len](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_group_concat_max_len)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--group-concat-max-len=#** |
| **System Variable** | [**group\_concat\_max\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_group_concat_max_len) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **1024** |
| **Minimum Value** | **4** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* The maximum permitted result length in bytes for the [**GROUP\_CONCAT()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_group-concat) function. The default is 1024.

* **[have\_compress](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_compress)**

**YES** if the **zlib** compression library is available to the server, **NO** if not. If not, the [**COMPRESS()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_compress) and [**UNCOMPRESS()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_uncompress) functions cannot be used.

* **[have\_dynamic\_loading](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_dynamic_loading)**

**YES** if **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** supports dynamic loading of plugins, **NO** if not. If the value is **NO**, you cannot use options such as **--plugin-load** to load plugins at server startup, or the [**INSTALL PLUGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-plugin) statement to load plugins at runtime.

* **[have\_geometry](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_geometry)**

**YES** if the server supports spatial data types, **NO** if not.

* **[have\_openssl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_openssl)**

This variable is a synonym for **[have\_ssl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_ssl)**.

As of MySQL 8.0.26, **[have\_openssl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_openssl)** is deprecated and subject to removal in a future MySQL version. For information about TLS properties of MySQL connection interfaces, use the **[tls\_channel\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-tls-channel-status-table" \o "27.12.21.7 The tls_channel_status Table)** table.

* **[have\_profiling](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_profiling)**

**YES** if statement profiling capability is present, **NO** if not. If present, the **profiling** system variable controls whether this capability is enabled or disabled. See [Section 13.7.7.31, “SHOW PROFILES Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-profiles).

This variable is deprecated and you should expect it to be removed in a future MySQL release.

* **[have\_query\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_query_cache)**

The query cache was removed in MySQL 8.0.3. **[have\_query\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_query_cache)** is deprecated, always has a value of **NO**, and you should expect it to be removed in a future MySQL release.

* **[have\_rtree\_keys](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_rtree_keys)**

**YES** if **RTREE** indexes are available, **NO** if not. (These are used for spatial indexes in **MyISAM** tables.)

* **[have\_ssl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_ssl)**

|  |  |
| --- | --- |
| **Deprecated** | 8.0.26 |
| **System Variable** | [**have\_ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_ssl) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Valid Values** | **YES** (SSL support available)  **DISABLED** (SSL support was compiled into server, but server was not started with necessary options to enable it) |

* **YES** if **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** supports SSL connections, **DISABLED** if the server was compiled with SSL support, but was not started with the appropriate connection-encryption options. For more information, see [Section 2.9.6, “Configuring SSL Library Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#source-ssl-library-configuration).
* As of MySQL 8.0.26, **[have\_ssl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_ssl)** is deprecated and subject to removal in a future MySQL version. For information about TLS properties of MySQL connection interfaces, use the **[tls\_channel\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-tls-channel-status-table" \o "27.12.21.7 The tls_channel_status Table)** table.

* **[have\_statement\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_statement_timeout)**

|  |  |
| --- | --- |
| **System Variable** | [**have\_statement\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_have_statement_timeout) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |

* Whether the statement execution timeout feature is available (see [Statement Execution Time Optimizer Hints](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-execution-time)). The value can be **NO** if the background thread used by this feature could not be initialized.

* **[have\_symlink](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_symlink)**

**YES** if symbolic link support is enabled, **NO** if not. This is required on Unix for support of the **DATA DIRECTORY** and **INDEX DIRECTORY** table options. If the server is started with the [--skip-symbolic-links](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_symbolic-links) option, the value is **DISABLED**.

This variable has no meaning on Windows.

**Note**

Symbolic link support, along with the [--symbolic-links](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_symbolic-links) option that controls it, is deprecated; expect these to be removed in a future version of MySQL. In addition, the option is disabled by default. The related **[have\_symlink](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_have_symlink)** system variable also is deprecated and you should expect it to be removed in a future version of MySQL.

* **[histogram\_generation\_max\_mem\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_histogram_generation_max_mem_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--histogram-generation-max-mem-size=#** |
| **System Variable** | [**histogram\_generation\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_histogram_generation_max_mem_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **20000000** |
| **Minimum Value** | **1000000** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* The maximum amount of memory available for generating histogram statistics. See [Section 8.9.6, “Optimizer Statistics”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-statistics), and [Section 13.7.3.1, “ANALYZE TABLE Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#analyze-table).
* Setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--host-cache-size=#** |
| **System Variable** | [**host\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_host_cache_size) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **-1** (signifies autosizing; do not assign this literal value) |
| **Minimum Value** | **0** |
| **Maximum Value** | **65536** |

* The MySQL server maintains an in-memory host cache that contains client host name and IP address information and is used to avoid Domain Name System (DNS) lookups; see [Section 5.1.12.3, “DNS Lookups and the Host Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache).
* The **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** variable controls the size of the host cache, as well as the size of the Performance Schema **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table that exposes the cache contents. Setting **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** has these effects:
  + Setting the size to 0 disables the host cache. With the cache disabled, the server performs a DNS lookup every time a client connects.
  + Changing the size at runtime causes an implicit host cache flushing operation that clears the host cache, truncates the **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table, and unblocks any blocked hosts.

The default value is autosized to 128, plus 1 for a value of **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** up to 500, plus 1 for every increment of 20 over 500 in the **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** value, capped to a limit of 2000.

Using the [--skip-host-cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-host-cache) option is similar to setting the **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** system variable to 0, but **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** is more flexible because it can also be used to resize, enable, and disable the host cache at runtime, not just at server startup. Starting the server with [--skip-host-cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-host-cache) does not prevent runtime changes to the value of **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)**, but such changes have no effect and the cache is not re-enabled even if **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** is set larger than 0.

* **[hostname](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_hostname)**

|  |  |
| --- | --- |
| **System Variable** | [**hostname**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_hostname) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The server sets this variable to the server host name at startup. The maximum length is 255 characters as of MySQL 8.0.17, per RFC 1034, and 60 characters before that.

* **[identity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_identity)**

This variable is a synonym for the **[last\_insert\_id](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_last_insert_id)** variable. It exists for compatibility with other database systems. You can read its value with **SELECT @@identity**, and set it using **SET identity**.

* **[init\_connect](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_connect)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--init-connect=name** |
| **System Variable** | [**init\_connect**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_init_connect) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* A string to be executed by the server for each client that connects. The string consists of one or more SQL statements, separated by semicolon characters.
* For users that have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege), the content of **[init\_connect](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_connect)** is not executed. This is done so that an erroneous value for **[init\_connect](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_connect)** does not prevent all clients from connecting. For example, the value might contain a statement that has a syntax error, thus causing client connections to fail. Not executing **[init\_connect](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_connect)** for users that have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege enables them to open a connection and fix the **[init\_connect](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_connect)** value.
* [**init\_connect**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_init_connect) execution is skipped for any client user with an expired password. This is done because such a user cannot execute arbitrary statements, and thus **[init\_connect](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_connect)** execution fails, leaving the client unable to connect. Skipping **[init\_connect](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_connect)** execution enables the user to connect and change password.
* The server discards any result sets produced by statements in the value of **[init\_connect](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_connect)**.

* **[information\_schema\_stats\_expiry](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_information_schema_stats_expiry)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--information-schema-stats-expiry=#** |
| **System Variable** | [**information\_schema\_stats\_expiry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_information_schema_stats_expiry) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **86400** |
| **Minimum Value** | **0** |
| **Maximum Value** | **31536000** |

* Some **INFORMATION\_SCHEMA** tables contain columns that provide table statistics:
* STATISTICS.CARDINALITY
* TABLES.AUTO\_INCREMENT
* TABLES.AVG\_ROW\_LENGTH
* TABLES.CHECKSUM
* TABLES.CHECK\_TIME
* TABLES.CREATE\_TIME
* TABLES.DATA\_FREE
* TABLES.DATA\_LENGTH
* TABLES.INDEX\_LENGTH
* TABLES.MAX\_DATA\_LENGTH
* TABLES.TABLE\_ROWS
* TABLES.UPDATE\_TIME
* Those columns represent dynamic table metadata; that is, information that changes as table contents change.
* By default, MySQL retrieves cached values for those columns from the **mysql.index\_stats** and **mysql.table\_stats** dictionary tables when the columns are queried, which is more efficient than retrieving statistics directly from the storage engine. If cached statistics are not available or have expired, MySQL retrieves the latest statistics from the storage engine and caches them in the **mysql.index\_stats** and **mysql.table\_stats** dictionary tables. Subsequent queries retrieve the cached statistics until the cached statistics expire.
* The **[information\_schema\_stats\_expiry](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_information_schema_stats_expiry)** session variable defines the period of time before cached statistics expire. The default is 86400 seconds (24 hours), but the time period can be extended to as much as one year.
* To update cached values at any time for a given table, use [**ANALYZE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#analyze-table).
* To always retrieve the latest statistics directly from the storage engine and bypass cached values, set **[information\_schema\_stats\_expiry](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_information_schema_stats_expiry)** to **0**.
* Querying statistics columns does not store or update statistics in the **mysql.index\_stats** and **mysql.table\_stats** dictionary tables under these circumstances:
  + When cached statistics have not expired.
  + When **[information\_schema\_stats\_expiry](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_information_schema_stats_expiry)** is set to 0.
  + When the server is started in **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)**, **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)**, **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)**, or **[innodb\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_read_only)** mode.
  + When the query also fetches Performance Schema data.

The statistics cache may be updated during a multiple-statement transaction before it is known whether the transaction commits. As a result, the cache may contain information that does not correspond to a known committed state. This can occur with **[autocommit=0](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_autocommit)** or after [**START TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit).

[**information\_schema\_stats\_expiry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_information_schema_stats_expiry) is a session variable, and each client session can define its own expiration value. Statistics that are retrieved from the storage engine and cached by one session are available to other sessions.

For related information, see [Section 8.2.3, “Optimizing INFORMATION\_SCHEMA Queries”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#information-schema-optimization).

* **[init\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_file)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--init-file=file\_name** |
| **System Variable** | [**init\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_init_file) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |

* If specified, this variable names a file containing SQL statements to be read and executed during the startup process. Prior to MySQL 8.0.18, each statement must be on a single line and should not include comments. As of MySQL 8.0.18, the acceptable format for statements in the file is expanded to support these constructs:
  + **delimiter ;**, to set the statement delimiter to the **;** character.
  + **delimiter $$**, to set the statement delimiter to the **$$** character sequence.
  + Multiple statements on the same line, delimited by the current delimiter.
  + Multiple-line statements.
  + Comments from a **#** character to the end of the line.
  + Comments from a **--** sequence to the end of the line.
  + C-style comments from a **/\*** sequence to the following **\*/** sequence, including over multiple lines.
  + Multiple-line string literals enclosed within either single quote (**'**) or double quote (**"**) characters.

If the server is started with the [--initialize](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_initialize) or [--initialize-insecure](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_initialize-insecure) option, it operates in bootstap mode and some functionality is unavailable that limits the statements permitted in the file. These include statements that relate to account management (such as [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user) or [**GRANT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#grant)), replication, and global transaction identifiers. See [Section 17.1.3, “Replication with Global Transaction Identifiers”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-gtids).

As of MySQL 8.0.17, threads created during server startup are used for tasks such as creating the data dictionary, running upgrade procedures, and creating system tables. To ensure a stable and predictable environment, these threads are executed with the server built-in defaults for some system variables, such as [**sql\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_mode), [**character\_set\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_server), [**collation\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_server), [**completion\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_completion_type), [**explicit\_defaults\_for\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_explicit_defaults_for_timestamp), and **[default\_table\_encryption](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_table_encryption)**.

These threads are also used to execute the statements in any file specified with **[init\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_init_file)** when starting the server, so such statements execute with the server's built-in default values for those system variables.

* **innodb\_*xxx***

[**InnoDB**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html) system variables are listed in [Section 15.14, “InnoDB Startup Options and System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-parameters). These variables control many aspects of storage, memory use, and I/O patterns for **InnoDB** tables, and are especially important now that **InnoDB** is the default storage engine.

* **[insert\_id](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_insert_id)**

The value to be used by the following [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert) or [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) statement when inserting an **AUTO\_INCREMENT** value. This is mainly used with the binary log.

* **[interactive\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_interactive_timeout)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--interactive-timeout=#** |
| **System Variable** | [**interactive\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_interactive_timeout) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **28800** |
| **Minimum Value** | **1** |

* The number of seconds the server waits for activity on an interactive connection before closing it. An interactive client is defined as a client that uses the **CLIENT\_INTERACTIVE** option to **[mysql\_real\_connect()](https://dev.mysql.com/doc/c-api/8.0/en/mysql-real-connect.html" \t "_top)**. See also **[wait\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_wait_timeout)**.

* **[internal\_tmp\_disk\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_internal_tmp_disk_storage_engine)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--internal-tmp-disk-storage-engine=#** |
| **Removed** | 8.0.16 |
| **System Variable** | [**internal\_tmp\_disk\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_internal_tmp_disk_storage_engine) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **INNODB** |
| **Valid Values** | **MYISAM**  **INNODB** |

* **Important**
* In MySQL 8.0.16 and later, on-disk internal temporary tables always use the **InnoDB** storage engine; as of MySQL 8.0.16, this variable has been removed and is thus no longer supported.
* Prior to MySQL 8.0.16, this variable determines the storage engine used for on-disk internal temporary tables (see [Storage Engine for On-Disk Internal Temporary Tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables-engines-disk)). Permitted values are **MYISAM** and **INNODB** (the default).

* **[internal\_tmp\_mem\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_internal_tmp_mem_storage_engine)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--internal-tmp-mem-storage-engine=#** |
| **System Variable** | [**internal\_tmp\_mem\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_internal_tmp_mem_storage_engine) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Enumeration |
| **Default Value** | **TempTable** |
| **Valid Values** | **TempTable**  **MEMORY** |

* The storage engine for in-memory internal temporary tables (see [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables)). Permitted values are **TempTable** (the default) and **MEMORY**.
* The [optimizer](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_optimizer) uses the storage engine defined by **[internal\_tmp\_mem\_storage\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_internal_tmp_mem_storage_engine)** for in-memory internal temporary tables.
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[join\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_join_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--join-buffer-size=#** |
| **System Variable** | [**join\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_join_buffer_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **262144** |
| **Minimum Value** | **128** |
| **Maximum Value (Windows)** | **4294967295** |
| **Maximum Value (Other, 64-bit platforms)** | **18446744073709547520** |
| **Maximum Value (Other, 32-bit platforms)** | **4294967295** |
| **Block Size** | **128** |

* The minimum size of the buffer that is used for plain index scans, range index scans, and joins that do not use indexes and thus perform full table scans. Normally, the best way to get fast joins is to add indexes. Increase the value of **[join\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_join_buffer_size)** to get a faster full join when adding indexes is not possible. One join buffer is allocated for each full join between two tables. For a complex join between several tables for which indexes are not used, multiple join buffers might be necessary.
* Unless a Block Nested-Loop or Batched Key Access algorithm is used, there is no gain from setting the buffer larger than required to hold each matching row, and all joins allocate at least the minimum size, so use caution in setting this variable to a large value globally. It is better to keep the global setting small and change the session setting to a larger value only in sessions that are doing large joins, or change the setting on a per-query basis by using a **SET\_VAR** optimizer hint (see [Section 8.9.3, “Optimizer Hints”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints)). Memory allocation time can cause substantial performance drops if the global size is larger than needed by most queries that use it.
* When Block Nested-Loop is used, a larger join buffer can be beneficial up to the point where all required columns from all rows in the first table are stored in the join buffer. This depends on the query; the optimal size may be smaller than holding all rows from the first tables.
* When Batched Key Access is used, the value of **[join\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_join_buffer_size)** defines how large the batch of keys is in each request to the storage engine. The larger the buffer, the more sequential access is made to the right hand table of a join operation, which can significantly improve performance.
* The default is 256KB. The maximum permissible setting for **[join\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_join_buffer_size)** is 4GB−1. Larger values are permitted for 64-bit platforms (except 64-bit Windows, for which large values are truncated to 4GB−1 with a warning).
* For additional information about join buffering, see [Section 8.2.1.7, “Nested-Loop Join Algorithms”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#nested-loop-joins). For information about Batched Key Access, see [Section 8.2.1.12, “Block Nested-Loop and Batched Key Access Joins”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#bnl-bka-optimization).

* **[keep\_files\_on\_create](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_keep_files_on_create)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--keep-files-on-create[={OFF|ON}]** |
| **System Variable** | [**keep\_files\_on\_create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_keep_files_on_create) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If a **MyISAM** table is created with no **DATA DIRECTORY** option, the .MYD file is created in the database directory. By default, if **MyISAM** finds an existing .MYD file in this case, it overwrites it. The same applies to .MYI files for tables created with no **INDEX DIRECTORY** option. To suppress this behavior, set the **[keep\_files\_on\_create](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_keep_files_on_create)** variable to **ON** (1), in which case **MyISAM** does not overwrite existing files and returns an error instead. The default value is **OFF** (0).
* If a **MyISAM** table is created with a **DATA DIRECTORY** or **INDEX DIRECTORY** option and an existing .MYD or .MYI file is found, MyISAM always returns an error. It does not overwrite a file in the specified directory.

* **[key\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--key-buffer-size=#** |
| **System Variable** | [**key\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_buffer_size) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **8388608** |
| **Minimum Value** | **8** |
| **Maximum Value (64-bit platforms)** | **OS\_PER\_PROCESS\_LIMIT** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* Index blocks for **MyISAM** tables are buffered and are shared by all threads. **[key\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_buffer_size)** is the size of the buffer used for index blocks. The key buffer is also known as the key cache.
* The maximum permissible setting for **[key\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_buffer_size)** is 4GB−1 on 32-bit platforms. Larger values are permitted for 64-bit platforms. The effective maximum size might be less, depending on your available physical RAM and per-process RAM limits imposed by your operating system or hardware platform. The value of this variable indicates the amount of memory requested. Internally, the server allocates as much memory as possible up to this amount, but the actual allocation might be less.
* You can increase the value to get better index handling for all reads and multiple writes; on a system whose primary function is to run MySQL using the **[MyISAM](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\storage-engines.html" \l "myisam-storage-engine" \o "16.2 The MyISAM Storage Engine)** storage engine, 25% of the machine's total memory is an acceptable value for this variable. However, you should be aware that, if you make the value too large (for example, more than 50% of the machine's total memory), your system might start to page and become extremely slow. This is because MySQL relies on the operating system to perform file system caching for data reads, so you must leave some room for the file system cache. You should also consider the memory requirements of any other storage engines that you may be using in addition to **[MyISAM](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\storage-engines.html" \l "myisam-storage-engine" \o "16.2 The MyISAM Storage Engine)**.
* For even more speed when writing many rows at the same time, use [**LOCK TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#lock-tables). See [Section 8.2.5.1, “Optimizing INSERT Statements”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#insert-optimization).
* You can check the performance of the key buffer by issuing a [**SHOW STATUS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-status) statement and examining the **[Key\_read\_requests](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_read_requests)**, **[Key\_reads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_reads)**, **[Key\_write\_requests](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_write_requests)**, and **[Key\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_writes)** status variables. (See [Section 13.7.7, “SHOW Statements”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show).) The **Key\_reads/Key\_read\_requests** ratio should normally be less than 0.01. The **Key\_writes/Key\_write\_requests** ratio is usually near 1 if you are using mostly updates and deletes, but might be much smaller if you tend to do updates that affect many rows at the same time or if you are using the **DELAY\_KEY\_WRITE** table option.
* The fraction of the key buffer in use can be determined using **[key\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_buffer_size)** in conjunction with the **[Key\_blocks\_unused](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_blocks_unused)** status variable and the buffer block size, which is available from the **[key\_cache\_block\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_cache_block_size)** system variable:
* 1 - ((Key\_blocks\_unused \* key\_cache\_block\_size) / key\_buffer\_size)
* This value is an approximation because some space in the key buffer is allocated internally for administrative structures. Factors that influence the amount of overhead for these structures include block size and pointer size. As block size increases, the percentage of the key buffer lost to overhead tends to decrease. Larger blocks results in a smaller number of read operations (because more keys are obtained per read), but conversely an increase in reads of keys that are not examined (if not all keys in a block are relevant to a query).
* It is possible to create multiple **MyISAM** key caches. The size limit of 4GB applies to each cache individually, not as a group. See [Section 8.10.2, “The MyISAM Key Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#myisam-key-cache).

* **[key\_cache\_age\_threshold](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_cache_age_threshold)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--key-cache-age-threshold=#** |
| **System Variable** | [**key\_cache\_age\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_age_threshold) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **300** |
| **Minimum Value** | **100** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |
| **Block Size** | **100** |

* This value controls the demotion of buffers from the hot sublist of a key cache to the warm sublist. Lower values cause demotion to happen more quickly. The minimum value is 100. The default value is 300. See [Section 8.10.2, “The MyISAM Key Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#myisam-key-cache).

* **[key\_cache\_block\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_cache_block_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--key-cache-block-size=#** |
| **System Variable** | [**key\_cache\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_block_size) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1024** |
| **Minimum Value** | **512** |
| **Maximum Value** | **16384** |
| **Block Size** | **512** |

* The size in bytes of blocks in the key cache. The default value is 1024. See [Section 8.10.2, “The MyISAM Key Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#myisam-key-cache).

* **[key\_cache\_division\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_cache_division_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--key-cache-division-limit=#** |
| **System Variable** | [**key\_cache\_division\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_division_limit) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **100** |
| **Minimum Value** | **1** |
| **Maximum Value** | **100** |

* The division point between the hot and warm sublists of the key cache buffer list. The value is the percentage of the buffer list to use for the warm sublist. Permissible values range from 1 to 100. The default value is 100. See [Section 8.10.2, “The MyISAM Key Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#myisam-key-cache).

* **[large\_files\_support](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_large_files_support)**

|  |  |
| --- | --- |
| **System Variable** | [**large\_files\_support**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_large_files_support) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |

* Whether **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** was compiled with options for large file support.

* **[large\_pages](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_large_pages)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--large-pages[={OFF|ON}]** |
| **System Variable** | [**large\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_large_pages) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Platform Specific** | Linux |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether large page support is enabled (via the [--large-pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_large-pages) option). See [Section 8.12.3.2, “Enabling Large Page Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#large-page-support).

* **[large\_page\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_large_page_size)**

|  |  |
| --- | --- |
| **System Variable** | [**large\_page\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_large_page_size) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |

* If large page support is enabled, this shows the size of memory pages. Large memory pages are supported only on Linux; on other platforms, the value of this variable is always 0. See [Section 8.12.3.2, “Enabling Large Page Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#large-page-support).

* **[last\_insert\_id](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_last_insert_id)**

The value to be returned from [**LAST\_INSERT\_ID()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_last-insert-id). This is stored in the binary log when you use [**LAST\_INSERT\_ID()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_last-insert-id) in a statement that updates a table. Setting this variable does not update the value returned by the **[mysql\_insert\_id()](https://dev.mysql.com/doc/c-api/8.0/en/mysql-insert-id.html" \t "_top)** C API function.

* **[lc\_messages](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lc_messages)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lc-messages=name** |
| **System Variable** | [**lc\_messages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_messages) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **en\_US** |

* The locale to use for error messages. The default is **en\_US**. The server converts the argument to a language name and combines it with the value of **[lc\_messages\_dir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lc_messages_dir)** to produce the location for the error message file. See [Section 10.12, “Setting the Error Message Language”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#error-message-language).

* **[lc\_messages\_dir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lc_messages_dir)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lc-messages-dir=dir\_name** |
| **System Variable** | [**lc\_messages\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_messages_dir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |

* The directory where error messages are located. The server uses the value together with the value of **[lc\_messages](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lc_messages)** to produce the location for the error message file. See [Section 10.12, “Setting the Error Message Language”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#error-message-language).

* **[lc\_time\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lc_time_names)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lc-time-names=value** |
| **System Variable** | [**lc\_time\_names**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_time_names) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* This variable specifies the locale that controls the language used to display day and month names and abbreviations. This variable affects the output from the [**DATE\_FORMAT()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_date-format), [**DAYNAME()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_dayname) and [**MONTHNAME()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_monthname) functions. Locale names are POSIX-style values such as **'ja\_JP'** or **'pt\_BR'**. The default value is **'en\_US'** regardless of your system's locale setting. For further information, see [Section 10.16, “MySQL Server Locale Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#locale-support).

* **[license](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_license)**

|  |  |
| --- | --- |
| **System Variable** | [**license**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_license) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **GPL** |

* The type of license the server has.

* **[local\_infile](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_local_infile)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--local-infile[={OFF|ON}]** |
| **System Variable** | [**local\_infile**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_local_infile) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable controls server-side **LOCAL** capability for [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data) statements. Depending on the **[local\_infile](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_local_infile)** setting, the server refuses or permits local data loading by clients that have **LOCAL** enabled on the client side.
* To explicitly cause the server to refuse or permit [**LOAD DATA LOCAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data) statements (regardless of how client programs and libraries are configured at build time or runtime), start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with **[local\_infile](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_local_infile)** disabled or enabled, respectively. **[local\_infile](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_local_infile)** can also be set at runtime. For more information, see [Section 6.1.6, “Security Considerations for LOAD DATA LOCAL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#load-data-local-security).

* **[lock\_wait\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_wait_timeout)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-wait-timeout=#** |
| **System Variable** | [**lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_wait_timeout) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **31536000** |
| **Minimum Value** | **1** |
| **Maximum Value** | **31536000** |

* This variable specifies the timeout in seconds for attempts to acquire metadata locks. The permissible values range from 1 to 31536000 (1 year). The default is 31536000.
* This timeout applies to all statements that use metadata locks. These include DML and DDL operations on tables, views, stored procedures, and stored functions, as well as [**LOCK TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#lock-tables), [**FLUSH TABLES WITH READ LOCK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-tables-with-read-lock), and [**HANDLER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#handler) statements.
* This timeout does not apply to implicit accesses to system tables in the **mysql** database, such as grant tables modified by [**GRANT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#grant) or [**REVOKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#revoke) statements or table logging statements. The timeout does apply to system tables accessed directly, such as with [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) or [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update).
* The timeout value applies separately for each metadata lock attempt. A given statement can require more than one lock, so it is possible for the statement to block for longer than the **[lock\_wait\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_wait_timeout)** value before reporting a timeout error. When lock timeout occurs, [**ER\_LOCK\_WAIT\_TIMEOUT**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_lock_wait_timeout) is reported.
* [**lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_wait_timeout) also defines the amount of time that a [**LOCK INSTANCE FOR BACKUP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#lock-instance-for-backup) statement waits for a lock before giving up.

* **[locked\_in\_memory](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_locked_in_memory)**

|  |  |
| --- | --- |
| **System Variable** | [**locked\_in\_memory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_locked_in_memory) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** was locked in memory with [--memlock](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_memlock).

* **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-error[=file\_name]** |
| **System Variable** | [**log\_error**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |

* The default error log destination. If the destination is the console, the value is **stderr**. Otherwise, the destination is a file and the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** value is the file name. See [Section 5.4.2, “The Error Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log).

* **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-error-services=value** |
| **System Variable** | [**log\_error\_services**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_services) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **log\_filter\_internal; log\_sink\_internal** |

* The components to enable for error logging. The variable may contain a list with 0, 1, or many elements. In the latter case, elements may be delimited by semicolon or (as of MySQL 8.0.12) comma, optionally followed by space. A given setting cannot use both semicolon and comma separators. Component order is significant because the server executes components in the order listed. Any loadable (not built in) component named in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value must first be installed with [**INSTALL COMPONENT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-component). For more information, see [Section 5.4.2.1, “Error Log Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-configuration).

* **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-error-suppression-list=value** |
| **Introduced** | 8.0.13 |
| **System Variable** | [**log\_error\_suppression\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_suppression_list) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **empty string** |

* The **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** system variable applies to events intended for the error log and specifies which events to suppress when they occur with a priority of **WARNING** or **INFORMATION**. For example, if a particular type of warning is considered undesirable “noise” in the error log because it occurs frequently but is not of interest, it can be suppressed. This variable affects filtering performed by the **log\_filter\_internal** error log filter component, which is enabled by default (see [Section 5.5.3, “Error Log Components”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-components)). If **log\_filter\_internal** is disabled, **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** has no effect.
* The **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** value may be the empty string for no suppression, or a list of one or more comma-separated values indicating the error codes to suppress. Error codes may be specified in symbolic or numeric form. A numeric code may be specified with or without the **MY-** prefix. Leading zeros in the numeric part are not significant. Examples of permitted code formats:
* ER\_SERVER\_SHUTDOWN\_COMPLETE
* MY-000031
* 000031
* MY-31
* 31
* Symbolic values are preferable to numeric values for readability and portability. For information about the permitted error symbols and numbers, see [MySQL 8.0 Error Message Reference](https://dev.mysql.com/doc/mysql-errors/8.0/en/).
* The effect of **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** combines with that of **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)**. For additional information, see [Section 5.4.2.5, “Priority-Based Error Log Filtering (log\_filter\_internal)”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-priority-based-filtering).

* **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-error-verbosity=#** |
| **System Variable** | [**log\_error\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_verbosity) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **2** |
| **Minimum Value** | **1** |
| **Maximum Value** | **3** |

* The **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** system variable specifies the verbosity for handling events intended for the error log. This variable affects filtering performed by the **log\_filter\_internal** error log filter component, which is enabled by default (see [Section 5.5.3, “Error Log Components”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-components)). If **log\_filter\_internal** is disabled, **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** has no effect.
* Events intended for the error log have a priority of **ERROR**, **WARNING**, or **INFORMATION**. **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** controls verbosity based on which priorities to permit for messages written to the log, as shown in the following table.

| **log\_error\_verbosity Value** | **Permitted Message Priorities** |
| --- | --- |
| 1 | **ERROR** |
| 2 | **ERROR**, **WARNING** |
| 3 | **ERROR**, **WARNING**, **INFORMATION** |

* There is also a priority of **SYSTEM**. System messages about non-error situations are printed to the error log regardless of the **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** value. These messages include startup and shutdown messages, and some significant changes to settings.
* The effect of **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** combines with that of **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)**. For additional information, see [Section 5.4.2.5, “Priority-Based Error Log Filtering (log\_filter\_internal)”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-priority-based-filtering).

* **[log\_output](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_output)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-output=name** |
| **System Variable** | [**log\_output**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_output) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Set |
| **Default Value** | **FILE** |
| **Valid Values** | **TABLE**  **FILE**  **NONE** |

* The destination or destinations for general query log and slow query log output. The value is a list one or more comma-separated words chosen from **TABLE**, **FILE**, and **NONE**. **TABLE** selects logging to the **[general\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log)** and **slow\_log** tables in the **mysql** system schema. **FILE** selects logging to log files. **NONE** disables logging. If **NONE** is present in the value, it takes precedence over any other words that are present. **TABLE** and **FILE** can both be given to select both log output destinations.
* This variable selects log output destinations, but does not enable log output. To do that, enable the **[general\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log)** and **[slow\_query\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log)** system variables. For **FILE** logging, the **[general\_log\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log_file)** and **[slow\_query\_log\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log_file)** system variables determine the log file locations. For more information, see [Section 5.4.1, “Selecting General Query Log and Slow Query Log Output Destinations”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#log-destinations).

* **[log\_queries\_not\_using\_indexes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_queries_not_using_indexes)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-queries-not-using-indexes[={OFF|ON}]** |
| **System Variable** | [**log\_queries\_not\_using\_indexes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_queries_not_using_indexes) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If you enable this variable with the slow query log enabled, queries that are expected to retrieve all rows are logged. See [Section 5.4.5, “The Slow Query Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#slow-query-log). This option does not necessarily mean that no index is used. For example, a query that uses a full index scan uses an index but would be logged because the index would not limit the number of rows.

* **[log\_raw](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_raw)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-raw[={OFF|ON}]** |
| **System Variable (≥ 8.0.19)** | [**log\_raw**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_raw) |
| **Scope (≥ 8.0.19)** | Global |
| **Dynamic (≥ 8.0.19)** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies (≥ 8.0.19)** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* The **[log\_raw](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_raw)** system variable is initially set to the value of the [--log-raw](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-raw) option. See the description of that option for more information. The system variable may also be set at runtime to change password masking behavior.

* **[log\_slow\_admin\_statements](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_slow_admin_statements)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-slow-admin-statements[={OFF|ON}]** |
| **System Variable** | [**log\_slow\_admin\_statements**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_slow_admin_statements) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Include slow administrative statements in the statements written to the slow query log. Administrative statements include [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table), [**ANALYZE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#analyze-table), [**CHECK TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#check-table), [**CREATE INDEX**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-index), [**DROP INDEX**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-index), [**OPTIMIZE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#optimize-table), and [**REPAIR TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#repair-table).

* **[log\_slow\_extra](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_slow_extra)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-slow-extra[={OFF|ON}]** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**log\_slow\_extra**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_slow_extra) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If the slow query log is enabled and the output destination includes **FILE**, the server writes additional fields to log file lines that provide information about slow statements. See [Section 5.4.5, “The Slow Query Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#slow-query-log). **TABLE** output is unaffected.

* **[log\_syslog](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-syslog[={OFF|ON}]** |
| **Deprecated** | Yes (removed in 8.0.13) |
| **System Variable** | [**log\_syslog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** (when error logging to system log is enabled) |

* Prior to MySQL 8.0, this variable controlled whether to perform error logging to the system log (the Event Log on Windows, and **syslog** on Unix and Unix-like systems).
* In MySQL 8.0, the **log\_sink\_syseventlog** log component implements error logging to the system log (see [Section 5.4.2.8, “Error Logging to the System Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-syslog)), so this type of logging can be enabled by adding that component to the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** system variable. **[log\_syslog](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog)** is removed. (Prior to MySQL 8.0.13, **[log\_syslog](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog)** exists but is deprecated and has no effect.)

* **[log\_syslog\_facility](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog_facility)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-syslog-facility=value** |
| **Removed** | 8.0.13 |
| **System Variable** | [**log\_syslog\_facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_facility) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **daemon** |

* This variable was removed in MySQL 8.0.13 and replaced by **[syseventlog.facility](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_syseventlog.facility)**.

* **[log\_syslog\_include\_pid](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog_include_pid)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-syslog-include-pid[={OFF|ON}]** |
| **Removed** | 8.0.13 |
| **System Variable** | [**log\_syslog\_include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_include_pid) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* This variable was removed in MySQL 8.0.13 and replaced by **[syseventlog.include\_pid](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_syseventlog.include_pid)**.

* **[log\_syslog\_tag](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog_tag)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-syslog-tag=tag** |
| **Removed** | 8.0.13 |
| **System Variable** | [**log\_syslog\_tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_tag) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **empty string** |

* This variable was removed in MySQL 8.0.13 and replaced by **[syseventlog.tag](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_syseventlog.tag)**.

* **[log\_timestamps](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_timestamps)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-timestamps=#** |
| **System Variable** | [**log\_timestamps**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_timestamps) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **UTC** |
| **Valid Values** | **UTC**  **SYSTEM** |

* This variable controls the time zone of timestamps in messages written to the error log, and in general query log and slow query log messages written to files. It does not affect the time zone of general query log and slow query log messages written to tables (**mysql.general\_log**, **mysql.slow\_log**). Rows retrieved from those tables can be converted from the local system time zone to any desired time zone with [**CONVERT\_TZ()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_convert-tz) or by setting the session **[time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_time_zone)** system variable.
* Permitted **[log\_timestamps](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_timestamps)** values are **UTC** (the default) and **SYSTEM** (the local system time zone).
* Timestamps are written using ISO 8601 / RFC 3339 format: ***YYYY-MM-DD*T*hh:mm:ss.uuuuuu*** plus a tail value of **Z** signifying Zulu time (UTC) or **±hh:mm** (an offset from UTC).

* **[log\_throttle\_queries\_not\_using\_indexes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_throttle_queries_not_using_indexes)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--log-throttle-queries-not-using-indexes=#** |
| **System Variable** | [**log\_throttle\_queries\_not\_using\_indexes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_throttle_queries_not_using_indexes) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |

* If **[log\_queries\_not\_using\_indexes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_queries_not_using_indexes)** is enabled, the **[log\_throttle\_queries\_not\_using\_indexes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_throttle_queries_not_using_indexes)** variable limits the number of such queries per minute that can be written to the slow query log. A value of 0 (the default) means “no limit”. For more information, see [Section 5.4.5, “The Slow Query Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#slow-query-log).

* **[long\_query\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_long_query_time)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--long-query-time=#** |
| **System Variable** | [**long\_query\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_long_query_time) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Numeric |
| **Default Value** | **10** |
| **Minimum Value** | **0** |

* If a query takes longer than this many seconds, the server increments the **[Slow\_queries](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Slow_queries)** status variable. If the slow query log is enabled, the query is logged to the slow query log file. This value is measured in real time, not CPU time, so a query that is under the threshold on a lightly loaded system might be above the threshold on a heavily loaded one. The minimum and default values of **[long\_query\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_long_query_time)** are 0 and 10, respectively. The value can be specified to a resolution of microseconds. See [Section 5.4.5, “The Slow Query Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#slow-query-log).
* Smaller values of this variable result in more statements being considered long-running, with the result that more space is required for the slow query log. For very small values (less than one second), the log may grow quite large in a small time. Increasing the number of statements considered long-running may also result in false positives for the “excessive Number of Long Running Processes” alert in MySQL Enterprise Monitor, especially if Group Replication is enabled. For these reasons, very small values should be used in test environments only, or, in production environments, only for a short period.

* **[low\_priority\_updates](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_low_priority_updates)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--low-priority-updates[={OFF|ON}]** |
| **System Variable** | [**low\_priority\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_low_priority_updates) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If set to **1**, all [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert), [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update), [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete), and **LOCK TABLE WRITE** statements wait until there is no pending [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) or **LOCK TABLE READ** on the affected table. The same effect can be obtained using **{INSERT | REPLACE | DELETE | UPDATE} LOW\_PRIORITY ...** to lower the priority of only one query. This variable affects only storage engines that use only table-level locking (such as **MyISAM**, **MEMORY**, and **MERGE**). See [Section 8.11.2, “Table Locking Issues”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#table-locking).
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[lower\_case\_file\_system](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_file_system)**

|  |  |
| --- | --- |
| **System Variable** | [**lower\_case\_file\_system**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lower_case_file_system) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |

* This variable describes the case sensitivity of file names on the file system where the data directory is located. **OFF** means file names are case-sensitive, **ON** means they are not case-sensitive. This variable is read only because it reflects a file system attribute and setting it would have no effect on the file system.

* **[lower\_case\_table\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_table_names)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lower-case-table-names[=#]** |
| **System Variable** | [**lower\_case\_table\_names**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lower_case_table_names) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **2** |

* If set to 0, table names are stored as specified and comparisons are case-sensitive. If set to 1, table names are stored in lowercase on disk and comparisons are not case-sensitive. If set to 2, table names are stored as given but compared in lowercase. This option also applies to database names and table aliases. For additional details, see [Section 9.2.3, “Identifier Case Sensitivity”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\language-structure.html#identifier-case-sensitivity).
* On Windows the default value is 1. On macOS, the default value is 2. On Linux, a value of 2 is not supported; the server forces the value to 0 instead.
* You should not set **[lower\_case\_table\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_table_names)** to 0 if you are running MySQL on a system where the data directory resides on a case-insensitive file system (such as on Windows or macOS). It is an unsupported combination that could result in a hang condition when running an **INSERT INTO ... SELECT ... FROM *tbl\_name*** operation with the wrong ***tbl\_name*** lettercase. With **MyISAM**, accessing table names using different lettercases could cause index corruption.
* An error message is printed and the server exits if you attempt to start the server with [**--lower\_case\_table\_names=0**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lower_case_table_names) on a case-insensitive file system.
* If you are using **InnoDB** tables, you should set this variable to 1 on all platforms to force names to be converted to lowercase.
* The setting of this variable affects the behavior of replication filtering options with regard to case sensitivity. For more information, see [Section 17.2.5, “How Servers Evaluate Replication Filtering Rules”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-rules).
* It is prohibited to start the server with a **[lower\_case\_table\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_table_names)** setting that is different from the setting used when the server was initialized. The restriction is necessary because collations used by various data dictionary table fields are determined by the setting defined when the server is initialized, and restarting the server with a different setting would introduce inconsistencies with respect to how identifiers are ordered and compared.
* It is therefore necessary to configure **[lower\_case\_table\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_table_names)** to the desired setting before initializing the server. In most cases, this requires configuring **[lower\_case\_table\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_table_names)** in a MySQL option file before starting the MySQL server for the first time. For APT installations on Debian and Ubuntu, however, the server is initialized for you, and there is no opportunity to configure the setting in an option file beforehand. You must therefore use the **debconf-set-selection** utility prior to installing MySQL using APT to enable **[lower\_case\_table\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_table_names)**. To do so, run this command before installing MySQL using APT:
* shell> sudo debconf-set-selections <<< "mysql-server mysql-server/lowercase-table-names select Enabled
* **Note**
* The ability to enable **[lower\_case\_table\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_table_names)** using **debconf-set-selections** was added in MySQL 8.0.17. Enabling **[lower\_case\_table\_names](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lower_case_table_names)** sets the value to 1.

* **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--mandatory-roles=value** |
| **System Variable** | [**mandatory\_roles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mandatory_roles) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **empty string** |

* Roles the server should treat as mandatory. In effect, these roles are automatically granted to every user, although setting **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** does not actually change any user accounts, and the granted roles are not visible in the **mysql.role\_edges** system table.
* The variable value is a comma-separated list of role names. Example:
* SET PERSIST mandatory\_roles = '`role1`@`%`,`role2`,role3,role4@localhost';
* Setting the runtime value of **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** requires the [**ROLE\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_role-admin) privilege, in addition to the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege) normally required to set a global system variable runtime value.
* Role names consist of a user part and host part in ***user\_name*@*host\_name*** format. The host part, if omitted, defaults to **%**. For additional information, see [Section 6.2.5, “Specifying Role Names”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#role-names).
* The **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** value is a string, so user names and host names, if quoted, must be written in a fashion permitted for quoting within quoted strings.
* Roles named in the value of **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** cannot be revoked with [**REVOKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#revoke) or dropped with [**DROP ROLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-role) or [**DROP USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-user).
* To prevent sessions from being made system sessions by default, a role that has the [**SYSTEM\_USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-user) privilege cannot be listed in the value of the **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** system variable:
  + If **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** is assigned a role at startup that has the [**SYSTEM\_USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-user) privilege, the server writes a message to the error log and exits.
  + If **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** is assigned a role at runtime that has the [**SYSTEM\_USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-user) privilege, an error occurs and the **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** value remains unchanged.

Mandatory roles, like explicitly granted roles, do not take effect until activated (see [Activating Roles](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#roles-activating)). At login time, role activation occurs for all granted roles if the **[activate\_all\_roles\_on\_login](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_activate_all_roles_on_login)** system variable is enabled; otherwise, or for roles that are set as default roles otherwise. At runtime, [**SET ROLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-role) activates roles.

Roles that do not exist when assigned to **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)** but are created later may require special treatment to be considered mandatory. For details, see [Defining Mandatory Roles](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#mandatory-roles).

[**SHOW GRANTS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-grants) displays mandatory roles according to the rules described in [Section 13.7.7.21, “SHOW GRANTS Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-grants).

* **[max\_allowed\_packet](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_allowed_packet)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-allowed-packet=#** |
| **System Variable** | [**max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_allowed_packet) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **67108864** |
| **Minimum Value** | **1024** |
| **Maximum Value** | **1073741824** |
| **Block Size** | **1024** |

* The maximum size of one packet or any generated/intermediate string, or any parameter sent by the **[mysql\_stmt\_send\_long\_data()](https://dev.mysql.com/doc/c-api/8.0/en/mysql-stmt-send-long-data.html" \t "_top)** C API function. The default is 64MB.
* The packet message buffer is initialized to **[net\_buffer\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_buffer_length)** bytes, but can grow up to **[max\_allowed\_packet](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_allowed_packet)** bytes when needed. This value by default is small, to catch large (possibly incorrect) packets.
* You must increase this value if you are using large [**BLOB**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#blob) columns or long strings. It should be as big as the largest [**BLOB**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#blob) you want to use. The protocol limit for **[max\_allowed\_packet](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_allowed_packet)** is 1GB. The value should be a multiple of 1024; nonmultiples are rounded down to the nearest multiple.
* When you change the message buffer size by changing the value of the **[max\_allowed\_packet](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_allowed_packet)** variable, you should also change the buffer size on the client side if your client program permits it. The default **[max\_allowed\_packet](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_allowed_packet)** value built in to the client library is 1GB, but individual client programs might override this. For example, **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** and **[mysqldump](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqldump" \o "4.5.4 mysqldump — A Database Backup Program)** have defaults of 16MB and 24MB, respectively. They also enable you to change the client-side value by setting **[max\_allowed\_packet](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_allowed_packet)** on the command line or in an option file.
* The session value of this variable is read only. The client can receive up to as many bytes as the session value. However, the server does not send to the client more bytes than the current global **[max\_allowed\_packet](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_allowed_packet)** value. (The global value could be less than the session value if the global value is changed after the client connects.)

* **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-connect-errors=#** |
| **System Variable** | [**max\_connect\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_connect_errors) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **100** |
| **Minimum Value** | **1** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* After **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** successive connection requests from a host are interrupted without a successful connection, the server blocks that host from further connections. If a connection from a host is established successfully within fewer than **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** attempts after a previous connection was interrupted, the error count for the host is cleared to zero. To unblock blocked hosts, flush the host cache; see [Flushing the Host Cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache-flushing).

* **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-connections=#** |
| **System Variable** | [**max\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_connections) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **151** |
| **Minimum Value** | **1** |
| **Maximum Value** | **100000** |

* The maximum permitted number of simultaneous client connections. For more information, see [Section 5.1.12.1, “Connection Interfaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces).

* **[max\_delayed\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_delayed_threads)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-delayed-threads=#** |
| **Deprecated** | Yes |
| **System Variable** | [**max\_delayed\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_delayed_threads) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **20** |
| **Minimum Value** | **0** |
| **Maximum Value** | **16384** |

* This system variable is deprecated (because **DELAYED** inserts are not supported) and subject to removal in a future MySQL release.
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[max\_digest\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_digest_length)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-digest-length=#** |
| **System Variable** | [**max\_digest\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_digest_length) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1024** |
| **Minimum Value** | **0** |
| **Maximum Value** | **1048576** |

* The maximum number of bytes of memory reserved per session for computation of normalized statement digests. Once that amount of space is used during digest computation, truncation occurs: no further tokens from a parsed statement are collected or figure into its digest value. Statements that differ only after that many bytes of parsed tokens produce the same normalized statement digest and are considered identical if compared or if aggregated for digest statistics.
* **Warning**
* Setting **[max\_digest\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_digest_length)** to zero disables digest production, which also disables server functionality that requires digests, such as MySQL Enterprise Firewall.
* Decreasing the **[max\_digest\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_digest_length)** value reduces memory use but causes the digest value of more statements to become indistinguishable if they differ only at the end. Increasing the value permits longer statements to be distinguished but increases memory use, particularly for workloads that involve large numbers of simultaneous sessions (the server allocates **[max\_digest\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_digest_length)** bytes per session).
* The parser uses this system variable as a limit on the maximum length of normalized statement digests that it computes. The Performance Schema, if it tracks statement digests, makes a copy of the digest value, using the **[performance\_schema\_max\_digest\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "sysvar_performance_schema_max_digest_length)**. system variable as a limit on the maximum length of digests that it stores. Consequently, if **[performance\_schema\_max\_digest\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "sysvar_performance_schema_max_digest_length)** is less than **[max\_digest\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_digest_length)**, digest values stored in the Performance Schema are truncated relative to the original digest values.
* For more information about statement digesting, see [Section 27.10, “Performance Schema Statement Digests and Sampling”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-statement-digests).

* **[max\_error\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_error_count)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-error-count=#** |
| **System Variable** | [**max\_error\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_error_count) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **1024** |
| **Minimum Value** | **0** |
| **Maximum Value** | **65535** |

* The maximum number of error, warning, and information messages to be stored for display by the [**SHOW ERRORS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-errors) and [**SHOW WARNINGS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-warnings) statements. This is the same as the number of condition areas in the diagnostics area, and thus the number of conditions that can be inspected by [**GET DIAGNOSTICS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#get-diagnostics).
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[max\_execution\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_execution_time)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-execution-time=#** |
| **System Variable** | [**max\_execution\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_execution_time) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **0** |

* The execution timeout for [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements, in milliseconds. If the value is 0, timeouts are not enabled.
* [**max\_execution\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_execution_time) applies as follows:
  + The global **[max\_execution\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_execution_time)** value provides the default for the session value for new connections. The session value applies to **SELECT** executions executed within the session that include no [**MAX\_EXECUTION\_TIME(*N*)**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-execution-time) optimizer hint or for which ***N*** is 0.
  + [**max\_execution\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_execution_time) applies to read-only [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements. Statements that are not read only are those that invoke a stored function that modifies data as a side effect.
  + [**max\_execution\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_execution_time) is ignored for [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements in stored programs.

* **[max\_heap\_table\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_heap_table_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-heap-table-size=#** |
| **System Variable** | [**max\_heap\_table\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_heap_table_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **16777216** |
| **Minimum Value** | **16384** |
| **Maximum Value (64-bit platforms)** | **18446744073709547520** |
| **Maximum Value (32-bit platforms)** | **4294967295** |
| **Block Size** | **1024** |

* This variable sets the maximum size to which user-created **MEMORY** tables are permitted to grow. The value of the variable is used to calculate **MEMORY** table **MAX\_ROWS** values. Setting this variable has no effect on any existing **MEMORY** table, unless the table is re-created with a statement such as [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) or altered with [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) or [**TRUNCATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#truncate-table). A server restart also sets the maximum size of existing **MEMORY** tables to the global **[max\_heap\_table\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_heap_table_size)** value.
* This variable is also used in conjunction with **[tmp\_table\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tmp_table_size)** to limit the size of internal in-memory tables. See [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables).
* **max\_heap\_table\_size** is not replicated. See [Section 17.5.1.21, “Replication and MEMORY Tables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-features-memory), and [Section 17.5.1.39, “Replication and Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-features-variables), for more information.
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[max\_insert\_delayed\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_insert_delayed_threads)**

|  |  |
| --- | --- |
| **Deprecated** | Yes |
| **System Variable** | [**max\_insert\_delayed\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_insert_delayed_threads) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |

* This variable is a synonym for **[max\_delayed\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_delayed_threads)**.
* This system variable is deprecated (because **DELAYED** inserts are not supported); expect it to be removed in a future release.

* **[max\_join\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_join_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-join-size=#** |
| **System Variable** | [**max\_join\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_join_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **18446744073709551615** |
| **Minimum Value** | **1** |
| **Maximum Value** | **18446744073709551615** |

* Do not permit statements that probably need to examine more than **[max\_join\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_join_size)** rows (for single-table statements) or row combinations (for multiple-table statements) or that are likely to do more than **[max\_join\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_join_size)** disk seeks. By setting this value, you can catch statements where keys are not used properly and that would probably take a long time. Set it if your users tend to perform joins that lack a **WHERE** clause, that take a long time, or that return millions of rows. For more information, see [Using Safe-Updates Mode (--safe-updates)](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#safe-updates).
* Setting this variable to a value other than **DEFAULT** resets the value of **[sql\_big\_selects](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_big_selects)** to **0**. If you set the **[sql\_big\_selects](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_big_selects)** value again, the **[max\_join\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_join_size)** variable is ignored.

* **[max\_length\_for\_sort\_data](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_length_for_sort_data)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-length-for-sort-data=#** |
| **Deprecated** | 8.0.20 |
| **System Variable** | [**max\_length\_for\_sort\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_length_for_sort_data) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **4096** |
| **Minimum Value** | **4** |
| **Maximum Value** | **8388608** |

* This variable is deprecated as of MySQL 8.0.20 due to optimizer changes that make it obsolete and of no effect. Previously, it acted as the cutoff on the size of index values that determines which **filesort** algorithm to use. See [Section 8.2.1.16, “ORDER BY Optimization”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#order-by-optimization).

* **[max\_points\_in\_geometry](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_points_in_geometry)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-points-in-geometry=#** |
| **System Variable** | [**max\_points\_in\_geometry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_points_in_geometry) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **65536** |
| **Minimum Value** | **3** |
| **Maximum Value** | **1048576** |

* The maximum value of the ***points\_per\_circle*** argument to the **[ST\_Buffer\_Strategy()](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\functions.html" \l "function_st-buffer-strategy)** function.

* **[max\_prepared\_stmt\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_prepared_stmt_count)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-prepared-stmt-count=#** |
| **System Variable** | [**max\_prepared\_stmt\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_prepared_stmt_count) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **16382** |
| **Minimum Value** | **0** |
| **Maximum Value (≥ 8.0.18)** | **4194304** |
| **Maximum Value (≤ 8.0.17)** | **1048576** |

* This variable limits the total number of prepared statements in the server. It can be used in environments where there is the potential for denial-of-service attacks based on running the server out of memory by preparing huge numbers of statements. If the value is set lower than the current number of prepared statements, existing statements are not affected and can be used, but no new statements can be prepared until the current number drops below the limit. Setting the value to 0 disables prepared statements.

* **[max\_seeks\_for\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_seeks_for_key)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-seeks-for-key=#** |
| **System Variable** | [**max\_seeks\_for\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_seeks_for_key) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value (Windows)** | **4294967295** |
| **Default Value (Other, 64-bit platforms)** | **18446744073709551615** |
| **Default Value (Other, 32-bit platforms)** | **4294967295** |
| **Minimum Value** | **1** |
| **Maximum Value (Windows)** | **4294967295** |
| **Maximum Value (Other, 64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (Other, 32-bit platforms)** | **4294967295** |

* Limit the assumed maximum number of seeks when looking up rows based on a key. The MySQL optimizer assumes that no more than this number of key seeks are required when searching for matching rows in a table by scanning an index, regardless of the actual cardinality of the index (see [Section 13.7.7.22, “SHOW INDEX Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-index)). By setting this to a low value (say, 100), you can force MySQL to prefer indexes instead of table scans.

* **[max\_sort\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_sort_length)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-sort-length=#** |
| **System Variable** | [**max\_sort\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_sort_length) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **1024** |
| **Minimum Value** | **4** |
| **Maximum Value** | **8388608** |

* The number of bytes to use when sorting data values. The server uses only the first **[max\_sort\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_sort_length)** bytes of each value and ignores the rest. Consequently, values that differ only after the first **[max\_sort\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_sort_length)** bytes compare as equal for **GROUP BY**, **ORDER BY**, and **DISTINCT** operations.
* Increasing the value of **[max\_sort\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_sort_length)** may require increasing the value of **[sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sort_buffer_size)** as well. For details, see [Section 8.2.1.16, “ORDER BY Optimization”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#order-by-optimization)

* **[max\_sp\_recursion\_depth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_sp_recursion_depth)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-sp-recursion-depth[=#]** |
| **System Variable** | [**max\_sp\_recursion\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_sp_recursion_depth) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Maximum Value** | **255** |

* The number of times that any given stored procedure may be called recursively. The default value for this option is 0, which completely disables recursion in stored procedures. The maximum value is 255.
* Stored procedure recursion increases the demand on thread stack space. If you increase the value of **[max\_sp\_recursion\_depth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_sp_recursion_depth)**, it may be necessary to increase thread stack size by increasing the value of **[thread\_stack](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_stack)** at server startup.

* **[max\_user\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_user_connections)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-user-connections=#** |
| **System Variable** | [**max\_user\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_user_connections) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **4294967295** |

* The maximum number of simultaneous connections permitted to any given MySQL user account. A value of 0 (the default) means “no limit.”
* This variable has a global value that can be set at server startup or runtime. It also has a read-only session value that indicates the effective simultaneous-connection limit that applies to the account associated with the current session. The session value is initialized as follows:
  + If the user account has a nonzero **MAX\_USER\_CONNECTIONS** resource limit, the session **[max\_user\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_user_connections)** value is set to that limit.
  + Otherwise, the session **[max\_user\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_user_connections)** value is set to the global value.

Account resource limits are specified using the [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user) or [**ALTER USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-user) statement. See [Section 6.2.20, “Setting Account Resource Limits”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#user-resources).

* **[max\_write\_lock\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_write_lock_count)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--max-write-lock-count=#** |
| **System Variable** | [**max\_write\_lock\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_write_lock_count) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value (Windows)** | **4294967295** |
| **Default Value (Other, 64-bit platforms)** | **18446744073709551615** |
| **Default Value (Other, 32-bit platforms)** | **4294967295** |
| **Minimum Value** | **1** |
| **Maximum Value (Windows)** | **4294967295** |
| **Maximum Value (Other, 64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (Other, 32-bit platforms)** | **4294967295** |

* After this many write locks, permit some pending read lock requests to be processed in between. Write lock requests have higher priority than read lock requests. However, if **[max\_write\_lock\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_write_lock_count)** is set to some low value (say, 10), read lock requests may be preferred over pending write lock requests if the read lock requests have already been passed over in favor of 10 write lock requests. Normally this behavior does not occur because **[max\_write\_lock\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_write_lock_count)** by default has a very large value.

* **[mecab\_rc\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mecab_rc_file)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--mecab-rc-file=file\_name** |
| **System Variable** | [**mecab\_rc\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mecab_rc_file) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |

* The **mecab\_rc\_file** option is used when setting up the MeCab full-text parser.
* The **mecab\_rc\_file** option defines the path to the mecabrc configuration file, which is the configuration file for MeCab. The option is read-only and can only be set at startup. The mecabrc configuration file is required to initialize MeCab.
* For information about the MeCab full-text parser, see [Section 12.10.9, “MeCab Full-Text Parser Plugin”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#fulltext-search-mecab).
* For information about options that can be specified in the MeCab mecabrc configuration file, refer to the [MeCab Documentation](http://mecab.googlecode.com/svn/trunk/mecab/doc/index.html" \t "_top) on the [Google Developers](https://code.google.com/) site.

* **[metadata\_locks\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_metadata_locks_cache_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--metadata-locks-cache-size=#** |
| **Deprecated** | Yes (removed in 8.0.13) |
| **System Variable** | [**metadata\_locks\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_metadata_locks_cache_size) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1024** |
| **Minimum Value** | **1** |
| **Maximum Value** | **1048576** |

* This system variable was removed in MySQL 8.0.13.

* **[metadata\_locks\_hash\_instances](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_metadata_locks_hash_instances)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--metadata-locks-hash-instances=#** |
| **Deprecated** | Yes (removed in 8.0.13) |
| **System Variable** | [**metadata\_locks\_hash\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_metadata_locks_hash_instances) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **8** |
| **Minimum Value** | **1** |
| **Maximum Value** | **1024** |

* This system variable was removed in MySQL 8.0.13.

* **[min\_examined\_row\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_min_examined_row_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--min-examined-row-limit=#** |
| **System Variable** | [**min\_examined\_row\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_min_examined_row_limit) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* Queries that examine fewer than this number of rows are not logged to the slow query log.
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[myisam\_data\_pointer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_data_pointer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-data-pointer-size=#** |
| **System Variable** | [**myisam\_data\_pointer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_data_pointer_size) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **6** |
| **Minimum Value** | **2** |
| **Maximum Value** | **7** |

* The default pointer size in bytes, to be used by [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) for **MyISAM** tables when no **MAX\_ROWS** option is specified. This variable cannot be less than 2 or larger than 7. The default value is 6. See [Section B.3.2.10, “The table is full”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#full-table).

* **[myisam\_max\_sort\_file\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_max_sort_file_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-max-sort-file-size=#** |
| **System Variable** | [**myisam\_max\_sort\_file\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_max_sort_file_size) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value (Windows)** | **2146435072** |
| **Default Value (Other, 64-bit platforms)** | **9223372036853727232** |
| **Default Value (Other, 32-bit platforms)** | **2147483648** |
| **Maximum Value (Windows)** | **2146435072** |
| **Maximum Value (Other, 64-bit platforms)** | **9223372036853727232** |
| **Maximum Value (Other, 32-bit platforms)** | **2147483648** |

* The maximum size of the temporary file that MySQL is permitted to use while re-creating a **MyISAM** index (during [**REPAIR TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#repair-table), [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table), or [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data)). If the file size would be larger than this value, the index is created using the key cache instead, which is slower. The value is given in bytes.
* If **MyISAM** index files exceed this size and disk space is available, increasing the value may help performance. The space must be available in the file system containing the directory where the original index file is located.

* **[myisam\_mmap\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_mmap_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-mmap-size=#** |
| **System Variable** | [**myisam\_mmap\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_mmap_size) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value (64-bit platforms)** | **18446744073709551615** |
| **Default Value (32-bit platforms)** | **4294967295** |
| **Minimum Value** | **7** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* The maximum amount of memory to use for memory mapping compressed **[MyISAM](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\storage-engines.html" \l "myisam-storage-engine" \o "16.2 The MyISAM Storage Engine)** files. If many compressed **MyISAM** tables are used, the value can be decreased to reduce the likelihood of memory-swapping problems.

* **[myisam\_recover\_options](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_recover_options)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-recover-options[=list]** |
| **System Variable** | [**myisam\_recover\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_recover_options) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **OFF** |
| **Valid Values** | **OFF**  **DEFAULT**  **BACKUP**  **FORCE**  **QUICK** |

* Set the **MyISAM** storage engine recovery mode. The variable value is any combination of the values of **OFF**, **DEFAULT**, **BACKUP**, **FORCE**, or **QUICK**. If you specify multiple values, separate them by commas. Specifying the variable with no value at server startup is the same as specifying **DEFAULT**, and specifying with an explicit value of **""** disables recovery (same as a value of **OFF**). If recovery is enabled, each time **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** opens a **MyISAM** table, it checks whether the table is marked as crashed or was not closed properly. (The last option works only if you are running with external locking disabled.) If this is the case, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** runs a check on the table. If the table was corrupted, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** attempts to repair it.
* The following options affect how the repair works.

| **Option** | **Description** |
| --- | --- |
| **OFF** | No recovery. |
| **DEFAULT** | Recovery without backup, forcing, or quick checking. |
| **BACKUP** | If the data file was changed during recovery, save a backup of the ***tbl\_name***.MYD file as ***tbl\_name-datetime***.BAK. |
| **FORCE** | Run recovery even if we would lose more than one row from the .MYD file. |
| **QUICK** | Do not check the rows in the table if there are not any delete blocks. |

* Before the server automatically repairs a table, it writes a note about the repair to the error log. If you want to be able to recover from most problems without user intervention, you should use the options **BACKUP,FORCE**. This forces a repair of a table even if some rows would be deleted, but it keeps the old data file as a backup so that you can later examine what happened.
* See [Section 16.2.1, “MyISAM Startup Options”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\storage-engines.html#myisam-start).

* **[myisam\_repair\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_repair_threads)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-repair-threads=#** |
| **System Variable** | [**myisam\_repair\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_repair_threads) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1** |
| **Minimum Value** | **1** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* If this value is greater than 1, **MyISAM** table indexes are created in parallel (each index in its own thread) during the **Repair by sorting** process. The default value is 1.
* **Note**
* Multithreaded repair is still beta-quality code.

* **[myisam\_sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_sort_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-sort-buffer-size=#** |
| **System Variable** | [**myisam\_sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_sort_buffer_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **8388608** |
| **Minimum Value** | **4096** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* The size of the buffer that is allocated when sorting **MyISAM** indexes during a [**REPAIR TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#repair-table) or when creating indexes with [**CREATE INDEX**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-index) or [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table).

* **[myisam\_stats\_method](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_stats_method)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-stats-method=name** |
| **System Variable** | [**myisam\_stats\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_stats_method) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **nulls\_unequal** |
| **Valid Values** | **nulls\_equal**  **nulls\_unequal**  **nulls\_ignored** |

* How the server treats **NULL** values when collecting statistics about the distribution of index values for **MyISAM** tables. This variable has three possible values, **nulls\_equal**, **nulls\_unequal**, and **nulls\_ignored**. For **nulls\_equal**, all **NULL** index values are considered equal and form a single value group that has a size equal to the number of **NULL** values. For **nulls\_unequal**, **NULL** values are considered unequal, and each **NULL** forms a distinct value group of size 1. For **nulls\_ignored**, **NULL** values are ignored.
* The method that is used for generating table statistics influences how the optimizer chooses indexes for query execution, as described in [Section 8.3.8, “InnoDB and MyISAM Index Statistics Collection”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#index-statistics).

* **[myisam\_use\_mmap](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_use_mmap)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--myisam-use-mmap[={OFF|ON}]** |
| **System Variable** | [**myisam\_use\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_use_mmap) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Use memory mapping for reading and writing **MyISAM** tables.

* **[mysql\_native\_password\_proxy\_users](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mysql_native_password_proxy_users)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--mysql-native-password-proxy-users[={OFF|ON}]** |
| **System Variable** | [**mysql\_native\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mysql_native_password_proxy_users) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable controls whether the **mysql\_native\_password** built-in authentication plugin supports proxy users. It has no effect unless the **[check\_proxy\_users](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_check_proxy_users)** system variable is enabled. For information about user proxying, see [Section 6.2.18, “Proxy Users”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#proxy-users).

* **[named\_pipe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_named_pipe)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--named-pipe[={OFF|ON}]** |
| **System Variable** | [**named\_pipe**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_named_pipe) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Platform Specific** | Windows |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* (Windows only.) Indicates whether the server supports connections over named pipes.

* **[named\_pipe\_full\_access\_group](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_named_pipe_full_access_group)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--named-pipe-full-access-group=value** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**named\_pipe\_full\_access\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_named_pipe_full_access_group) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Platform Specific** | Windows |
| **Type** | String |
| **Default Value** | **empty string** |
| **Valid Values** | **empty string**  **valid Windows local group name**  **\*everyone\*** |

* (Windows only.) The access control granted to clients on the named pipe created by the MySQL server is set to the minimum necessary for successful communication when the **[named\_pipe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_named_pipe)** system variable is enabled to support named-pipe connections. Newer MySQL client software can open named pipe connections without any additional configuration; however, older client software may still require full access to open a named pipe connection.
* This variable sets the name of a Windows local group whose members are granted sufficient access by the MySQL server to use older named-pipe clients. As of MySQL 8.0.24, the default value is set to an empty string, which means that no Windows user is granted full access to the named pipe.
* A new Windows local group name (for example, **mysql\_old\_client\_users**) can be created in Windows and then used to replace the default value when access is absolutely necessary. In this case, limit the membership of the group to as few users as possible, removing users from the group when their client software is upgraded. A non-member of the group who attempts to open a connection to MySQL with the older named-pipe client is denied access until a Windows administrator adds the user to the group. Newly added users must log out and log in again to join the group (required by Windows).
* Setting the value to **'\*everyone\*'** provides a language-independent way of referring to the Everyone group on Windows. The Everyone group is not secure by default.

* **[net\_buffer\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_buffer_length)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--net-buffer-length=#** |
| **System Variable** | [**net\_buffer\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_buffer_length) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **16384** |
| **Minimum Value** | **1024** |
| **Maximum Value** | **1048576** |
| **Block Size** | **1024** |

* Each client thread is associated with a connection buffer and result buffer. Both begin with a size given by **[net\_buffer\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_buffer_length)** but are dynamically enlarged up to **[max\_allowed\_packet](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_allowed_packet)** bytes as needed. The result buffer shrinks to **[net\_buffer\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_buffer_length)** after each SQL statement.
* This variable should not normally be changed, but if you have very little memory, you can set it to the expected length of statements sent by clients. If statements exceed this length, the connection buffer is automatically enlarged. The maximum value to which **[net\_buffer\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_buffer_length)** can be set is 1MB.
* The session value of this variable is read only.

* **[net\_read\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_read_timeout)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--net-read-timeout=#** |
| **System Variable** | [**net\_read\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_read_timeout) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **30** |
| **Minimum Value** | **1** |

* The number of seconds to wait for more data from a connection before aborting the read. When the server is reading from the client, **[net\_read\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_read_timeout)** is the timeout value controlling when to abort. When the server is writing to the client, **[net\_write\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_write_timeout)** is the timeout value controlling when to abort. See also **[slave\_net\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_slave_net_timeout)**.

* **[net\_retry\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_retry_count)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--net-retry-count=#** |
| **System Variable** | [**net\_retry\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_retry_count) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **10** |
| **Minimum Value** | **1** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* If a read or write on a communication port is interrupted, retry this many times before giving up. This value should be set quite high on FreeBSD because internal interrupts are sent to all threads.

* **[net\_write\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_write_timeout)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--net-write-timeout=#** |
| **System Variable** | [**net\_write\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_write_timeout) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **60** |
| **Minimum Value** | **1** |

* The number of seconds to wait for a block to be written to a connection before aborting the write. See also **[net\_read\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_net_read_timeout)**.

* **[new](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_new)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--new[={OFF|ON}]** |
| **System Variable** | [**new**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_new) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Disabled by** | **skip-new** |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable was used in MySQL 4.0 to turn on some 4.1 behaviors, and is retained for backward compatibility. Its value is always **OFF**.
* In NDB Cluster, setting this variable to **ON** makes it possible to employ partitioning types other than **KEY** or **LINEAR KEY** with [**NDB**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html) tables. This feature is experimental only, and not supported in production. For additional information, see [User-defined partitioning and the NDB storage engine (NDB Cluster)](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\partitioning.html#partitioning-limitations-ndb).

* **[ngram\_token\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ngram_token_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ngram-token-size=#** |
| **System Variable** | [**ngram\_token\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ngram_token_size) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **2** |
| **Minimum Value** | **1** |
| **Maximum Value** | **10** |

* Defines the n-gram token size for the n-gram full-text parser. The **ngram\_token\_size** option is read-only and can only be modified at startup. The default value is 2 (bigram). The maximum value is 10.
* For more information about how to configure this variable, see [Section 12.10.8, “ngram Full-Text Parser”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#fulltext-search-ngram).

* **[offline\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_offline_mode)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--offline-mode[={OFF|ON}]** |
| **System Variable** | [**offline\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_offline_mode) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the server is in “offline mode”, which has these characteristics:
  + Connected client users who do not have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege) are disconnected on the next request, with an appropriate error. Disconnection includes terminating running statements and releasing locks. Such clients also cannot initiate new connections, and receive an appropriate error.
  + Connected client users who have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege are not disconnected, and can initiate new connections to manage the server.
  + Replication threads are permitted to keep applying data to the server.

Only users who have the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege can control offline mode. To put a server in offline mode, change the value of the **[offline\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_offline_mode)** system variable from **OFF** to **ON**. To resume normal operations, change **[offline\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_offline_mode)** from **ON** to **OFF**. In offline mode, clients that are refused access receive an [**ER\_SERVER\_OFFLINE\_MODE**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_server_offline_mode) error.

* **[old](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_old)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--old[={OFF|ON}]** |
| **System Variable** | [**old**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* [**old**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old) is a compatibility variable. It is disabled by default, but can be enabled at startup to revert the server to behaviors present in older versions.
* When [**old**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old) is enabled, it changes the default scope of index hints to that used prior to MySQL 5.1.17. That is, index hints with no **FOR** clause apply only to how indexes are used for row retrieval and not to resolution of **ORDER BY** or **GROUP BY** clauses. (See [Section 8.9.4, “Index Hints”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#index-hints).) Take care about enabling this in a replication setup. With statement-based binary logging, having different modes for the source and replicas might lead to replication errors.

* **[old\_alter\_table](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_old_alter_table)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--old-alter-table[={OFF|ON}]** |
| **System Variable** | [**old\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old_alter_table) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* When this variable is enabled, the server does not use the optimized method of processing an [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) operation. It reverts to using a temporary table, copying over the data, and then renaming the temporary table to the original, as used by MySQL 5.0 and earlier. For more information on the operation of [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table), see [Section 13.1.9, “ALTER TABLE Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table).
* **ALTER TABLE ... DROP PARTITION** with **[old\_alter\_table=ON](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_old_alter_table)** rebuilds the partitioned table and attempts to move data from the dropped partition to another partition with a compatible **PARTITION ... VALUES** definition. Data that cannot be moved to another partition is deleted. In earlier releases, **ALTER TABLE ... DROP PARTITION** with **[old\_alter\_table=ON](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_old_alter_table)** deletes data stored in the partition and drops the partition.

* **[open\_files\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_open_files_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--open-files-limit=#** |
| **System Variable** | [**open\_files\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_open_files_limit) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **5000, with possible adjustment** |
| **Minimum Value** | **0** |
| **Maximum Value** | **platform dependent** |

* The number of file descriptors available to **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** from the operating system:
  + At startup, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** reserves descriptors with setrlimit(), using the value requested at by setting this variable directly or by using the [--open-files-limit](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysqld_safe_open-files-limit) option to **[mysqld\_safe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld-safe" \o "4.3.2 mysqld_safe — MySQL Server Startup Script)**. If **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** produces the error **Too many open files**, try increasing the **[open\_files\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_open_files_limit)** value. Internally, the maximum value for this variable is the maximum unsigned integer value, but the actual maximum is platform dependent.
  + At runtime, the value of **[open\_files\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_open_files_limit)** indicates the number of file descriptors actually permitted to **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** by the operating system, which might differ from the value requested at startup. If the number of file descriptors requested during startup cannot be allocated, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** writes a warning to the error log.

The effective **[open\_files\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_open_files_limit)** value is based on the value specified at system startup (if any) and the values of **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** and **[table\_open\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache)**, using these formulas:

* + **10 + max\_connections + (table\_open\_cache \* 2)**
  + **max\_connections \* 5**
  + MySQL 8.0.19 and higher: The operating system limit.
  + Prior to MySQL 8.0.19:
    - The operating system limit if that limit is positive but not Infinity.
    - If the operating system limit is Infinity: **open\_files\_limit** value if specified at startup, 5000 if not.

The server attempts to obtain the number of file descriptors using the maximum of those values, capped to the maximum unsigned integer value. If that many descriptors cannot be obtained, the server attempts to obtain as many as the system permits.

The effective value is 0 on systems where MySQL cannot change the number of open files.

On Unix, the value cannot be set greater than the value displayed by the **ulimit -n** command.

* **[optimizer\_prune\_level](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_prune_level)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--optimizer-prune-level=#** |
| **System Variable** | [**optimizer\_prune\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_prune_level) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **1** |
| **Minimum Value** | **0** |
| **Maximum Value** | **1** |

* Controls the heuristics applied during query optimization to prune less-promising partial plans from the optimizer search space. A value of 0 disables heuristics so that the optimizer performs an exhaustive search. A value of 1 causes the optimizer to prune plans based on the number of rows retrieved by intermediate plans.

* **[optimizer\_search\_depth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_search_depth)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--optimizer-search-depth=#** |
| **System Variable** | [**optimizer\_search\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_search_depth) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **62** |
| **Minimum Value** | **0** |
| **Maximum Value** | **62** |

* The maximum depth of search performed by the query optimizer. Values larger than the number of relations in a query result in better query plans, but take longer to generate an execution plan for a query. Values smaller than the number of relations in a query return an execution plan quicker, but the resulting plan may be far from being optimal. If set to 0, the system automatically picks a reasonable value.

* **[optimizer\_switch](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_switch)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--optimizer-switch=value** |
| **System Variable** | [**optimizer\_switch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_switch) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Set |
| **Valid Values (≥ 8.0.22)** | **batched\_key\_access={on|off}**  **block\_nested\_loop={on|off}**  **condition\_fanout\_filter={on|off}**  **derived\_condition\_pushdown={on|off}**  **derived\_merge={on|off}**  **duplicateweedout={on|off}**  **engine\_condition\_pushdown={on|off}**  **firstmatch={on|off}**  **hash\_join={on|off}**  **index\_condition\_pushdown={on|off}**  **index\_merge={on|off}**  **index\_merge\_intersection={on|off}**  **index\_merge\_sort\_union={on|off}**  **index\_merge\_union={on|off}**  **loosescan={on|off}**  **materialization={on|off}**  **mrr={on|off}**  **mrr\_cost\_based={on|off}**  **prefer\_ordering\_index={on|off}**  **semijoin={on|off}**  **skip\_scan={on|off}**  **subquery\_materialization\_cost\_based={on|off}**  **use\_index\_extensions={on|off}**  **use\_invisible\_indexes={on|off}** |
| **Valid Values (≥ 8.0.21)** | **batched\_key\_access={on|off}**  **block\_nested\_loop={on|off}**  **condition\_fanout\_filter={on|off}**  **derived\_merge={on|off}**  **duplicateweedout={on|off}**  **engine\_condition\_pushdown={on|off}**  **firstmatch={on|off}**  **hash\_join={on|off}**  **index\_condition\_pushdown={on|off}**  **index\_merge={on|off}**  **index\_merge\_intersection={on|off}**  **index\_merge\_sort\_union={on|off}**  **index\_merge\_union={on|off}**  **loosescan={on|off}**  **materialization={on|off}**  **mrr={on|off}**  **mrr\_cost\_based={on|off}**  **prefer\_ordering\_index={on|off}**  **semijoin={on|off}**  **skip\_scan={on|off}**  **subquery\_materialization\_cost\_based={on|off}**  **use\_index\_extensions={on|off}**  **use\_invisible\_indexes={on|off}** |
| **Valid Values (≥ 8.0.18)** | **batched\_key\_access={on|off}**  **block\_nested\_loop={on|off}**  **condition\_fanout\_filter={on|off}**  **derived\_merge={on|off}**  **duplicateweedout={on|off}**  **engine\_condition\_pushdown={on|off}**  **firstmatch={on|off}**  **hash\_join={on|off}**  **index\_condition\_pushdown={on|off}**  **index\_merge={on|off}**  **index\_merge\_intersection={on|off}**  **index\_merge\_sort\_union={on|off}**  **index\_merge\_union={on|off}**  **loosescan={on|off}**  **materialization={on|off}**  **mrr={on|off}**  **mrr\_cost\_based={on|off}**  **semijoin={on|off}**  **skip\_scan={on|off}**  **subquery\_materialization\_cost\_based={on|off}**  **use\_index\_extensions={on|off}**  **use\_invisible\_indexes={on|off}** |
| **Valid Values (≥ 8.0.13)** | **batched\_key\_access={on|off}**  **block\_nested\_loop={on|off}**  **condition\_fanout\_filter={on|off}**  **derived\_merge={on|off}**  **duplicateweedout={on|off}**  **engine\_condition\_pushdown={on|off}**  **firstmatch={on|off}**  **index\_condition\_pushdown={on|off}**  **index\_merge={on|off}**  **index\_merge\_intersection={on|off}**  **index\_merge\_sort\_union={on|off}**  **index\_merge\_union={on|off}**  **loosescan={on|off}**  **materialization={on|off}**  **mrr={on|off}**  **mrr\_cost\_based={on|off}**  **semijoin={on|off}**  **skip\_scan={on|off}**  **subquery\_materialization\_cost\_based={on|off}**  **use\_index\_extensions={on|off}**  **use\_invisible\_indexes={on|off}** |
| **Valid Values (≤ 8.0.12)** | **batched\_key\_access={on|off}**  **block\_nested\_loop={on|off}**  **condition\_fanout\_filter={on|off}**  **derived\_merge={on|off}**  **duplicateweedout={on|off}**  **engine\_condition\_pushdown={on|off}**  **firstmatch={on|off}**  **index\_condition\_pushdown={on|off}**  **index\_merge={on|off}**  **index\_merge\_intersection={on|off}**  **index\_merge\_sort\_union={on|off}**  **index\_merge\_union={on|off}**  **loosescan={on|off}**  **materialization={on|off}**  **mrr={on|off}**  **mrr\_cost\_based={on|off}**  **semijoin={on|off}**  **subquery\_materialization\_cost\_based={on|off}**  **use\_index\_extensions={on|off}**  **use\_invisible\_indexes={on|off}** |

* The **[optimizer\_switch](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_switch)** system variable enables control over optimizer behavior. The value of this variable is a set of flags, each of which has a value of **on** or **off** to indicate whether the corresponding optimizer behavior is enabled or disabled. This variable has global and session values and can be changed at runtime. The global default can be set at server startup.
* To see the current set of optimizer flags, select the variable value:
* mysql> **SELECT @@optimizer\_switch\G**
* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
* @@optimizer\_switch: index\_merge=on,index\_merge\_union=on,
* index\_merge\_sort\_union=on,index\_merge\_intersection=on,
* engine\_condition\_pushdown=on,index\_condition\_pushdown=on,
* mrr=on,mrr\_cost\_based=on,block\_nested\_loop=on,
* batched\_key\_access=off,materialization=on,semijoin=on,
* loosescan=on,firstmatch=on,duplicateweedout=on,
* subquery\_materialization\_cost\_based=on,
* use\_index\_extensions=on,condition\_fanout\_filter=on,
* derived\_merge=on,use\_invisible\_indexes=off,skip\_scan=on,
* hash\_join=on,subquery\_to\_derived=off,
* prefer\_ordering\_index=on,hypergraph\_optimizer=off,
* derived\_condition\_pushdown=on
* For more information about the syntax of this variable and the optimizer behaviors that it controls, see [Section 8.9.2, “Switchable Optimizations”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#switchable-optimizations).

* **[optimizer\_trace](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_trace)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--optimizer-trace=value** |
| **System Variable** | [**optimizer\_trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* This variable controls optimizer tracing. For details, see [MySQL Internals: Tracing the Optimizer](https://dev.mysql.com/doc/internals/en/optimizer-tracing.html).

* **[optimizer\_trace\_features](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_trace_features)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--optimizer-trace-features=value** |
| **System Variable** | [**optimizer\_trace\_features**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_features) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* This variable enables or disables selected optimizer tracing features. For details, see [MySQL Internals: Tracing the Optimizer](https://dev.mysql.com/doc/internals/en/optimizer-tracing.html).

* **[optimizer\_trace\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_trace_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--optimizer-trace-limit=#** |
| **System Variable** | [**optimizer\_trace\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_limit) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1** |

* The maximum number of optimizer traces to display. For details, see [MySQL Internals: Tracing the Optimizer](https://dev.mysql.com/doc/internals/en/optimizer-tracing.html).

* **[optimizer\_trace\_max\_mem\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_trace_max_mem_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--optimizer-trace-max-mem-size=#** |
| **System Variable** | [**optimizer\_trace\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_max_mem_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **1048576** |

* The maximum cumulative size of stored optimizer traces. For details, see [MySQL Internals: Tracing the Optimizer](https://dev.mysql.com/doc/internals/en/optimizer-tracing.html).

* **[optimizer\_trace\_offset](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_optimizer_trace_offset)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--optimizer-trace-offset=#** |
| **System Variable** | [**optimizer\_trace\_offset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_offset) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **-1** |

* The offset of optimizer traces to display. For details, see [MySQL Internals: Tracing the Optimizer](https://dev.mysql.com/doc/internals/en/optimizer-tracing.html).
* **performance\_schema\_*xxx***

Performance Schema system variables are listed in [Section 27.15, “Performance Schema System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-system-variables). These variables may be used to configure Performance Schema operation.

* **[parser\_max\_mem\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_parser_max_mem_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--parser-max-mem-size=#** |
| **System Variable** | [**parser\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_parser_max_mem_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value (64-bit platforms)** | **18446744073709551615** |
| **Default Value (32-bit platforms)** | **4294967295** |
| **Minimum Value** | **10000000** |
| **Maximum Value (64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (32-bit platforms)** | **4294967295** |

* The maximum amount of memory available to the parser. The default value places no limit on memory available. The value can be reduced to protect against out-of-memory situations caused by parsing long or complex SQL statements.

* **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--partial-revokes[={OFF|ON}]** |
| **Introduced** | 8.0.16 |
| **System Variable** | [**partial\_revokes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_partial_revokes) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** (if partial revokes do not exist)  **ON** (if partial revokes exist) |

* Enabling this variable makes it possible to revoke privileges partially. Specifically, for users who have privileges at the global level, **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)** enables privileges for specific schemas to be revoked while leaving the privileges in place for other schemas. For example, a user who has the global [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_update) privilege can be restricted from exercising this privilege on the **mysql** system schema. (Or, stated another way, the user is enabled to exercise the [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_update) privilege on all schemas except the **mysql** schema.) In this sense, the user's global [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_update) privilege is partially revoked.
* Once enabled, **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)** cannot be disabled if any account has privilege restrictions. If any such account exists, disabling **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)** fails:
  + For attempts to disable **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)** at startup, the server logs an error message and enables **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)**.
  + For attempts to disable **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)** at runtime, an error occurs and the **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)** value remains unchanged.

To disable **[partial\_revokes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_partial_revokes)** in this case, first modify each account that has partially revoked privileges, either by re-granting the privileges or by removing the account.

For more information, including instructions for removing partial revokes, see [Section 6.2.12, “Privilege Restriction Using Partial Revokes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#partial-revokes).

* **[password\_history](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_password_history)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--password-history=#** |
| **System Variable** | [**password\_history**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_history) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **4294967295** |

* This variable defines the global policy for controlling reuse of previous passwords based on required minimum number of password changes. For an account password used previously, this variable indicates the number of subsequent account password changes that must occur before the password can be reused. If the value is 0 (the default), there is no reuse restriction based on number of password changes.
* Changes to this variable apply immediately to all accounts defined with the **PASSWORD HISTORY DEFAULT** option.
* The global number-of-changes password reuse policy can be overridden as desired for individual accounts using the **PASSWORD HISTORY** option of the [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user) and [**ALTER USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-user) statements. See [Section 6.2.15, “Password Management”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#password-management).

* **[password\_require\_current](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_password_require_current)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--password-require-current[={OFF|ON}]** |
| **Introduced** | 8.0.13 |
| **System Variable** | [**password\_require\_current**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_require_current) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable defines the global policy for controlling whether attempts to change an account password must specify the current password to be replaced.
* Changes to this variable apply immediately to all accounts defined with the **PASSWORD REQUIRE CURRENT DEFAULT** option.
* The global verification-required policy can be overridden as desired for individual accounts using the **PASSWORD REQUIRE** option of the [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user) and [**ALTER USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-user) statements. See [Section 6.2.15, “Password Management”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#password-management).

* **[password\_reuse\_interval](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_password_reuse_interval)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--password-reuse-interval=#** |
| **System Variable** | [**password\_reuse\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_reuse_interval) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **4294967295** |

* This variable defines the global policy for controlling reuse of previous passwords based on time elapsed. For an account password used previously, this variable indicates the number of days that must pass before the password can be reused. If the value is 0 (the default), there is no reuse restriction based on time elapsed.
* Changes to this variable apply immediately to all accounts defined with the **PASSWORD REUSE INTERVAL DEFAULT** option.
* The global time-elapsed password reuse policy can be overridden as desired for individual accounts using the **PASSWORD REUSE INTERVAL** option of the [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user) and [**ALTER USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-user) statements. See [Section 6.2.15, “Password Management”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#password-management).

* **[persisted\_globals\_load](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_persisted_globals_load)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--persisted-globals-load[={OFF|ON}]** |
| **System Variable** | [**persisted\_globals\_load**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persisted_globals_load) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* Whether to load persisted configuration settings from the mysqld-auto.cnf file in the data directory. The server normally processes this file at startup after all other option files (see [Section 4.2.2.2, “Using Option Files”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option-files)). Disabling **[persisted\_globals\_load](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_persisted_globals_load)** causes the server startup sequence to skip **mysqld-auto.cnf**.
* To modify the contents of mysqld-auto.cnf, use the [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), and [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) statements. See [Section 5.1.9.3, “Persisted System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables).

* **[persist\_only\_admin\_x509\_subject](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_persist_only_admin_x509_subject)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--persist-only-admin-x509-subject=string** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **empty string** |

* [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) and [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) enable system variables to be persisted to the mysqld-auto.cnf option file in the data directory (see [Section 13.7.6.1, “SET Syntax for Variable Assignment”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable)). Persisting system variables enables runtime configuration changes that affect subsequent server restarts, which is convenient for remote administration not requiring direct access to MySQL server host option files. However, some system variables are nonpersistible or can be persisted only under certain restrictive conditions.
* The [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) system variable specifies the SSL certificate X.509 Subject value that users must have to be able to persist system variables that are persist-restricted. The default value is the empty string, which disables the Subject check so that persist-restricted system variables cannot be persisted by any user.
* If [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) is nonempty, users who connect to the server using an encrypted connection and supply an SSL certificate with the designated Subject value then can use [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) to persist persist-restricted system variables. For information about persist-restricted system variables and instructions for configuring MySQL to enable [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject), see [Section 5.1.9.4, “Nonpersistible and Persist-Restricted System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#nonpersistible-system-variables).

* **[pid\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_pid_file)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--pid-file=file\_name** |
| **System Variable** | [**pid\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pid_file) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |

* The path name of the file in which the server writes its process ID. The server creates the file in the data directory unless an absolute path name is given to specify a different directory. If you specify this variable, you must specify a value. If you do not specify this variable, MySQL uses a default value of ***host\_name***.pid, where ***host\_name*** is the name of the host machine.
* The process ID file is used by other programs such as **[mysqld\_safe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld-safe" \o "4.3.2 mysqld_safe — MySQL Server Startup Script)** to determine the server's process ID. On Windows, this variable also affects the default error log file name. See [Section 5.4.2, “The Error Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log).

* **[plugin\_dir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_plugin_dir)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--plugin-dir=dir\_name** |
| **System Variable** | [**plugin\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_plugin_dir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **BASEDIR/lib/plugin** |

* The path name of the plugin directory.
* If the plugin directory is writable by the server, it may be possible for a user to write executable code to a file in the directory using [**SELECT ... INTO DUMPFILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select). This can be prevented by making **[plugin\_dir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_plugin_dir)** read only to the server or by setting **[secure\_file\_priv](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_secure_file_priv)** to a directory where [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) writes can be made safely.

* **[port](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_port)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--port=port\_num** |
| **System Variable** | [**port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_port) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **3306** |
| **Minimum Value** | **0** |
| **Maximum Value** | **65535** |

* The number of the port on which the server listens for TCP/IP connections. This variable can be set with the [--port](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_port) option.

* **[preload\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_preload_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--preload-buffer-size=#** |
| **System Variable** | [**preload\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_preload_buffer_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **32768** |
| **Minimum Value** | **1024** |
| **Maximum Value** | **1073741824** |

* The size of the buffer that is allocated when preloading indexes.
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[print\_identified\_with\_as\_hex](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_print_identified_with_as_hex)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--print-identified-with-as-hex[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**print\_identified\_with\_as\_hex**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_print_identified_with_as_hex) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Password hash values displayed in the **IDENTIFIED WITH** clause of output from [**SHOW CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-user) may contain unprintable characters that have adverse effects on terminal displays and in other environments. Enabling **[print\_identified\_with\_as\_hex](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_print_identified_with_as_hex)** causes [**SHOW CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-user) to display such hash values as hexadecimal strings rather than as regular string literals. Hash values that do not contain unprintable characters still display as regular string literals, even with this variable enabled.

* **[profiling](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_profiling)**

If set to 0 or **OFF** (the default), statement profiling is disabled. If set to 1 or **ON**, statement profiling is enabled and the [**SHOW PROFILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-profile) and [**SHOW PROFILES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-profiles) statements provide access to profiling information. See [Section 13.7.7.31, “SHOW PROFILES Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-profiles).

This variable is deprecated; expect it to be removed in a future MySQL release.

* **[profiling\_history\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_profiling_history_size)**

The number of statements for which to maintain profiling information if [**profiling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_profiling) is enabled. The default value is 15. The maximum value is 100. Setting the value to 0 effectively disables profiling. See [Section 13.7.7.31, “SHOW PROFILES Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-profiles).

This variable is deprecated; expect it to be removed in a future MySQL release.

* **[protocol\_compression\_algorithms](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_protocol_compression_algorithms)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--protocol-compression-algorithms=value** |
| **Introduced** | 8.0.18 |
| **System Variable** | [**protocol\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_protocol_compression_algorithms) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Set |
| **Default Value** | **zlib,zstd,uncompressed** |
| **Valid Values** | **zlib**  **zstd**  **uncompressed** |

* The compression algorithms that the server permits for incoming connections. These include connections by client programs and by servers participating in source/replica replication or Group Replication. Compression does not apply to connections for **FEDERATED** tables.
* [**protocol\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_protocol_compression_algorithms) does not control connection compression for X Protocol. See [Section 20.5.5, “Connection Compression with X Plugin”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#x-plugin-connection-compression) for information on how this operates.
* The variable value is a list of one or more comma-separated compression algorithm names, in any order, chosen from the following items (not case-sensitive):
  + **zlib**: Permit connections that use the **zlib** compression algorithm.
  + **zstd**: Permit connections that use the **zstd** compression algorithm (zstd 1.3).
  + **uncompressed**: Permit uncompressed connections. If this algorithm name is not included in the **[protocol\_compression\_algorithms](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_protocol_compression_algorithms)** value, the server does not permit uncompressed connections. It permits only compressed connections that use whichever other algorithms are specified in the value, and there is no fallback to uncompressed connections.

The default value of **zlib,zstd,uncompressed** indicates that the server permits all compression algorithms.

For more information, see [Section 4.2.8, “Connection Compression Control”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#connection-compression-control).

* **[protocol\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_protocol_version)**

|  |  |
| --- | --- |
| **System Variable** | [**protocol\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_protocol_version) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |

* The version of the client/server protocol used by the MySQL server.

* **[proxy\_user](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_proxy_user)**

|  |  |
| --- | --- |
| **System Variable** | [**proxy\_user**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_proxy_user) |
| **Scope** | Session |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* If the current client is a proxy for another user, this variable is the proxy user account name. Otherwise, this variable is **NULL**. See [Section 6.2.18, “Proxy Users”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#proxy-users).

* **[pseudo\_slave\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_pseudo_slave_mode)**

|  |  |
| --- | --- |
| **System Variable** | [**pseudo\_slave\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_slave_mode) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |

* This system variable is for internal server use. **[pseudo\_slave\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_pseudo_slave_mode)** assists with the correct handling of transactions that originated on older or newer servers than the server currently processing them. **[mysqlbinlog](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqlbinlog" \o "4.6.9 mysqlbinlog — Utility for Processing Binary Log Files)** sets the value of **[pseudo\_slave\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_pseudo_slave_mode)** to true before executing any SQL statements.
* Setting the session value of this system variable is a restricted operation. The session user must have either the [**REPLICATION\_APPLIER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_replication-applier) privilege (see [Section 17.3.3, “Replication Privilege Checks”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-privilege-checks)), or privileges sufficient to set restricted session variables (see [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges)). However, note that the variable is not intended for users to set; it is set automatically by the replication infrastructure.
* [**pseudo\_slave\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_slave_mode) has the following effects on the handling of prepared XA transactions, which can be attached to or detached from the handling session (by default, the session that issues [**XA START**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#xa)):
  + If true, and the handling session has executed an internal-use [**BINLOG**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#binlog) statement, XA transactions are automatically detached from the session as soon as the first part of the transaction up to [**XA PREPARE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#xa) finishes, so they can be committed or rolled back by any session that has the [**XA\_RECOVER\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_xa-recover-admin) privilege.
  + If false, XA transactions remain attached to the handling session as long as that session is alive, during which time no other session can commit the transaction. The prepared transaction is only detached if the session disconnects or the server restarts.

[**pseudo\_slave\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_slave_mode) has the following effects on the **original\_commit\_timestamp** replication delay timestamp and the **[original\_server\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_original_server_version)** system variable:

* + If true, transactions that do not explicitly set **original\_commit\_timestamp** or **[original\_server\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_original_server_version)** are assumed to originate on another, unknown server, so the value 0, meaning unknown, is assigned to both the timestamp and the system variable.
  + If false, transactions that do not explicitly set **original\_commit\_timestamp** or **[original\_server\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_original_server_version)** are assumed to originate on the current server, so the current timestamp and the current server's version are assigned to the timestamp and the system variable.

In MySQL 8.0.14 and later, **pseudo\_slave\_mode** has the following effects on the handling of a statement that sets one or more unsupported (removed or unknown) SQL modes:

* + If true, the server ignores the unsupported mode and raises a warning.
  + If false, the server rejects the statement with [**ER\_UNSUPPORTED\_SQL\_MODE**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_unsupported_sql_mode).

* **[pseudo\_thread\_id](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_pseudo_thread_id)**

|  |  |
| --- | --- |
| **System Variable** | [**pseudo\_thread\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_thread_id) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |

* This variable is for internal server use.
* **Warning**
* Changing the session value of the **[pseudo\_thread\_id](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_pseudo_thread_id)** system variable changes the value returned by the [**CONNECTION\_ID()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_connection-id) function.
* As of MySQL 8.0.14, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[query\_alloc\_block\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_query_alloc_block_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--query-alloc-block-size=#** |
| **System Variable** | [**query\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_query_alloc_block_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **8192** |
| **Minimum Value** | **1024** |
| **Maximum Value** | **4294967295** |
| **Unit** | **bytes** |
| **Block Size** | **1024** |

* The allocation size in bytes of memory blocks that are allocated for objects created during statement parsing and execution. If you have problems with memory fragmentation, it might help to increase this parameter.

* **[query\_prealloc\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_query_prealloc_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--query-prealloc-size=#** |
| **System Variable** | [**query\_prealloc\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_query_prealloc_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **8192** |
| **Minimum Value** | **8192** |
| **Maximum Value (64-bit platforms)** | **18446744073709547520** |
| **Maximum Value (32-bit platforms)** | **4294967295** |
| **Block Size** | **1024** |

* The size in bytes of the persistent buffer used for statement parsing and execution. This buffer is not freed between statements. If you are running complex queries, a larger **[query\_prealloc\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_query_prealloc_size)** value might be helpful in improving performance, because it can reduce the need for the server to perform memory allocation during query execution operations.

* **[rand\_seed1](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_rand_seed1)**

|  |  |
| --- | --- |
| **System Variable** | [**rand\_seed1**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed1) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |

* The [**rand\_seed1**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed1) and [**rand\_seed2**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed2) variables exist as session variables only, and can be set but not read. The variables—but not their values—are shown in the output of [**SHOW VARIABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-variables).
* The purpose of these variables is to support replication of the [**RAND()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_rand) function. For statements that invoke [**RAND()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_rand), the source passes two values to the replica, where they are used to seed the random number generator. The replica uses these values to set the session variables [**rand\_seed1**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed1) and [**rand\_seed2**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed2) so that [**RAND()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_rand) on the replica generates the same value as on the source.

* **[rand\_seed2](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_rand_seed2)**

See the description for [**rand\_seed1**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed1).

* **[range\_alloc\_block\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_range_alloc_block_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--range-alloc-block-size=#** |
| **System Variable** | [**range\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_range_alloc_block_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **4096** |
| **Minimum Value** | **4096** |
| **Maximum Value (64-bit platforms)** | **18446744073709547520** |
| **Maximum Value** | **4294967295** |
| **Block Size** | **1024** |

* The size in bytes of blocks that are allocated when doing range optimization.

* **[range\_optimizer\_max\_mem\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_range_optimizer_max_mem_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--range-optimizer-max-mem-size=#** |
| **System Variable** | [**range\_optimizer\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_range_optimizer_max_mem_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **8388608** |
| **Minimum Value** | **0** |
| **Maximum Value** | **18446744073709551615** |

* The limit on memory consumption for the range optimizer. A value of 0 means “no limit.” If an execution plan considered by the optimizer uses the range access method but the optimizer estimates that the amount of memory needed for this method would exceed the limit, it abandons the plan and considers other plans. For more information, see [Limiting Memory Use for Range Optimization](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#range-optimization-memory-use).

* **[rbr\_exec\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_rbr_exec_mode)**

|  |  |
| --- | --- |
| **System Variable** | [**rbr\_exec\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rbr_exec_mode) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **STRICT** |
| **Valid Values** | **IDEMPOTENT**  **STRICT** |

* For internal use by **[mysqlbinlog](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqlbinlog" \o "4.6.9 mysqlbinlog — Utility for Processing Binary Log Files)**. This variable switches the server between **IDEMPOTENT** mode and **STRICT** mode. **IDEMPOTENT** mode causes suppression of duplicate-key and no-key-found errors in [**BINLOG**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#binlog) statements generated by **[mysqlbinlog](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqlbinlog" \o "4.6.9 mysqlbinlog — Utility for Processing Binary Log Files)**. This mode is useful when replaying a row-based binary log on a server that causes conflicts with existing data. **[mysqlbinlog](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqlbinlog" \o "4.6.9 mysqlbinlog — Utility for Processing Binary Log Files)** sets this mode when you specify the [--idempotent](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysqlbinlog_idempotent) option by writing the following to the output:
* SET SESSION RBR\_EXEC\_MODE=IDEMPOTENT;
* As of MySQL 8.0.18, setting the session value of this system variable is no longer a restricted operation.

* **[read\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--read-buffer-size=#** |
| **System Variable** | [**read\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_buffer_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **131072** |
| **Minimum Value** | **8192** |
| **Maximum Value** | **2147479552** |
| **Block Size** | **4096** |

* Each thread that does a sequential scan for a **MyISAM** table allocates a buffer of this size (in bytes) for each table it scans. If you do many sequential scans, you might want to increase this value, which defaults to 131072. The value of this variable should be a multiple of 4KB. If it is set to a value that is not a multiple of 4KB, its value is rounded down to the nearest multiple of 4KB.
* This option is also used in the following context for all storage engines:
  + For caching the indexes in a temporary file (not a temporary table), when sorting rows for **ORDER BY**.
  + For bulk insert into partitions.
  + For caching results of nested queries.

[**read\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_buffer_size) is also used in one other storage engine-specific way: to determine the memory block size for [**MEMORY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\storage-engines.html#memory-storage-engine) tables.

Beginning with MySQL 8.0.22, the value of **[select\_into\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_select_into_buffer_size)** is used in place of the value of **read\_buffer\_size** for the buffer used when executing [**SELECT INTO DUMPFILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select-into) and **SELECT INTO OUTFILE** statements.

For more information about memory use during different operations, see [Section 8.12.3.1, “How MySQL Uses Memory”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#memory-use).

* **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--read-only[={OFF|ON}]** |
| **System Variable** | [**read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_only) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If the **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** system variable is enabled, the server permits no client updates except from users who have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege). This variable is disabled by default.
* The server also supports a **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)** system variable (disabled by default), which has these effects:
  + If **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)** is enabled, the server prohibits client updates, even from users who have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege.
  + Setting **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)** to **ON** implicitly forces **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** to **ON**.
  + Setting **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** to **OFF** implicitly forces **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)** to **OFF**.

Even with **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** enabled, the server permits these operations:

* + Updates performed by replication threads, if the server is a replica. In replication setups, it can be useful to enable **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** on replica servers to ensure that replicas accept updates only from the replication source server and not from clients.
  + Writes to the system table **mysql.gtid\_executed**, which stores GTIDs for executed transactions that are not present in the current binary log file.
  + Use of [**ANALYZE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#analyze-table) or [**OPTIMIZE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#optimize-table) statements. The purpose of read-only mode is to prevent changes to table structure or contents. Analysis and optimization do not qualify as such changes. This means, for example, that consistency checks on read-only replicas can be performed with **[mysqlcheck --all-databases --analyze](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqlcheck" \o "4.5.3 mysqlcheck — A Table Maintenance Program)**.
  + Operations on **TEMPORARY** tables.
  + Inserts into the log tables (**mysql.general\_log** and **mysql.slow\_log**); see [Section 5.4.1, “Selecting General Query Log and Slow Query Log Output Destinations”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#log-destinations).
  + Updates to Performance Schema tables, such as [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) or [**TRUNCATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#truncate-table) operations.

Changes to **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** on a replication source server are not replicated to replica servers. The value can be set on a replica server independent of the setting on the source.

The following conditions apply to attempts to enable **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** (including implicit attempts resulting from enabling **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)**):

* + The attempt fails and an error occurs if you have any explicit locks (acquired with [**LOCK TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#lock-tables)) or have a pending transaction.
  + The attempt blocks while other clients have any ongoing statement, active **LOCK TABLES WRITE**, or ongoing commit, until the locks are released and the statements and transactions end. While the attempt to enable **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** is pending, requests by other clients for table locks or to begin transactions also block until **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** has been set.
  + The attempt blocks if there are active transactions that hold metadata locks, until those transactions end.
  + [**read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_only) can be enabled while you hold a global read lock (acquired with [**FLUSH TABLES WITH READ LOCK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-tables-with-read-lock)) because that does not involve table locks.

* **[read\_rnd\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_rnd_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--read-rnd-buffer-size=#** |
| **System Variable** | [**read\_rnd\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_rnd_buffer_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **262144** |
| **Minimum Value** | **1** |
| **Maximum Value** | **2147483647** |

* This variable is used for reads from **MyISAM** tables, and, for any storage engine, for Multi-Range Read optimization.
* When reading rows from a **MyISAM** table in sorted order following a key-sorting operation, the rows are read through this buffer to avoid disk seeks. See [Section 8.2.1.16, “ORDER BY Optimization”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#order-by-optimization). Setting the variable to a large value can improve **ORDER BY** performance by a lot. However, this is a buffer allocated for each client, so you should not set the global variable to a large value. Instead, change the session variable only from within those clients that need to run large queries.
* For more information about memory use during different operations, see [Section 8.12.3.1, “How MySQL Uses Memory”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#memory-use). For information about Multi-Range Read optimization, see [Section 8.2.1.11, “Multi-Range Read Optimization”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#mrr-optimization).

* **[regexp\_stack\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_regexp_stack_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--regexp-stack-limit=#** |
| **System Variable** | [**regexp\_stack\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_regexp_stack_limit) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **8000000** |
| **Minimum Value** | **0** |
| **Maximum Value** | **2147483647** |

* The maximum available memory in bytes for the internal stack used for regular expression matching operations performed by [**REGEXP\_LIKE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_regexp-like) and similar functions (see [Section 12.8.2, “Regular Expressions”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#regexp)).

* **[regexp\_time\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_regexp_time_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--regexp-time-limit=#** |
| **System Variable** | [**regexp\_time\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_regexp_time_limit) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **32** |
| **Minimum Value** | **0** |
| **Maximum Value** | **2147483647** |

* The time limit for regular expression matching operations performed by [**REGEXP\_LIKE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_regexp-like) and similar functions (see [Section 12.8.2, “Regular Expressions”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#regexp)). This limit is expressed as the maximum permitted number of steps performed by the match engine, and thus affects execution time only indirectly. Typically, it is on the order of milliseconds.

* **[require\_row\_format](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_require_row_format)**

|  |  |
| --- | --- |
| **Introduced** | 8.0.19 |
| **System Variable** | [**require\_row\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_require_row_format) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable is for internal server use by replication and **[mysqlbinlog](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqlbinlog" \o "4.6.9 mysqlbinlog — Utility for Processing Binary Log Files)**. It restricts DML events executed in the session to events encoded in row-based binary logging format only, and temporary tables cannot be created. Queries that do not respect the restrictions fail.
* Setting the session value of this system variable to **ON** requires no privileges. Setting the session value of this system variable to **OFF** is a restricted operation, and the session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[require\_secure\_transport](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_require_secure_transport)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--require-secure-transport[={OFF|ON}]** |
| **System Variable** | [**require\_secure\_transport**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_require_secure_transport) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether client connections to the server are required to use some form of secure transport. When this variable is enabled, the server permits only TCP/IP connections encrypted using TLS/SSL, or connections that use a socket file (on Unix) or shared memory (on Windows). The server rejects nonsecure connection attempts, which fail with an [**ER\_SECURE\_TRANSPORT\_REQUIRED**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_secure_transport_required) error.
* This capability supplements per-account SSL requirements, which take precedence. For example, if an account is defined with **REQUIRE SSL**, enabling **[require\_secure\_transport](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_require_secure_transport)** does not make it possible to use the account to connect using a Unix socket file.
* It is possible for a server to have no secure transports available. For example, a server on Windows supports no secure transports if started without specifying any SSL certificate or key files and with the **[shared\_memory](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_shared_memory)** system variable disabled. Under these conditions, attempts to enable **[require\_secure\_transport](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_require_secure_transport)** at startup cause the server to write a message to the error log and exit. Attempts to enable the variable at runtime fail with an [**ER\_NO\_SECURE\_TRANSPORTS\_CONFIGURED**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_no_secure_transports_configured) error.
* See also [Configuring Encrypted Connections as Mandatory](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#mandatory-encrypted-connections).

* **[resultset\_metadata](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_resultset_metadata)**

|  |  |
| --- | --- |
| **System Variable** | [**resultset\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_resultset_metadata) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **FULL** |
| **Valid Values** | **FULL**  **NONE** |

* For connections for which metadata transfer is optional, the client sets the **[resultset\_metadata](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_resultset_metadata)** system variable to control whether the server returns result set metadata. Permitted values are **FULL** (return all metadata; this is the default) and **NONE** (return no metadata).
* For connections that are not metadata-optional, setting **[resultset\_metadata](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_resultset_metadata)** to **NONE** produces an error.
* For details about managing result set metadata transfer, see [Optional Result Set Metadata](https://dev.mysql.com/doc/c-api/8.0/en/c-api-optional-metadata.html).

* **[secondary\_engine\_cost\_threshold](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_secondary_engine_cost_threshold)**

|  |  |
| --- | --- |
| **Introduced** | 8.0.16 |
| **System Variable** | [**secondary\_engine\_cost\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_secondary_engine_cost_threshold) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Numeric |
| **Default Value** | **100000.000000** |
| **Minimum Value** | **0** |
| **Maximum Value** | **DBL\_MAX (maximum double value)** |

* The optimizer cost threshold for query offload to a secondary engine.
* For use with HeatWave. See [HeatWave User Guide](https://dev.mysql.com/doc/heatwave/en/" \t "_top).

* **[schema\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_schema_definition_cache)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--schema-definition-cache=#** |
| **System Variable** | [**schema\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_schema_definition_cache) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **256** |
| **Minimum Value** | **256** |
| **Maximum Value** | **524288** |

* Defines a limit for the number of schema definition objects, both used and unused, that can be kept in the dictionary object cache.
* Unused schema definition objects are only kept in the dictionary object cache when the number in use is less than the capacity defined by **schema\_definition\_cache**.
* A setting of **0** means that schema definition objects are only kept in the dictionary object cache while they are in use.
* For more information, see [Section 14.4, “Dictionary Object Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-dictionary.html#data-dictionary-object-cache).

* **[secure\_file\_priv](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_secure_file_priv)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--secure-file-priv=dir\_name** |
| **System Variable** | [**secure\_file\_priv**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_secure_file_priv) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **platform specific** |
| **Valid Values** | **empty string**  **dirname**  **NULL** |

* This variable is used to limit the effect of data import and export operations, such as those performed by the [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data) and [**SELECT ... INTO OUTFILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select-into) statements and the [**LOAD\_FILE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_load-file) function. These operations are permitted only to users who have the [**FILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_file) privilege.
* [**secure\_file\_priv**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_secure_file_priv) may be set as follows:
  + If empty, the variable has no effect. This is not a secure setting.
  + If set to the name of a directory, the server limits import and export operations to work only with files in that directory. The directory must exist; the server does not create it.
  + If set to **NULL**, the server disables import and export operations.

The default value is platform specific and depends on the value of the [INSTALL\_LAYOUT](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#option_cmake_install_layout) **CMake** option, as shown in the following table. To specify the default **[secure\_file\_priv](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_secure_file_priv)** value explicitly if you are building from source, use the [INSTALL\_SECURE\_FILE\_PRIVDIR](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#option_cmake_install_secure_file_privdir) **CMake** option.

| **INSTALL\_LAYOUT Value** | **Default secure\_file\_priv Value** |
| --- | --- |
| **STANDALONE** | empty |
| **DEB**, **RPM**, **SVR4** | /var/lib/mysql-files |
| Otherwise | mysql-files under the [CMAKE\_INSTALL\_PREFIX](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#option_cmake_cmake_install_prefix) value |

The server checks the value of **[secure\_file\_priv](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_secure_file_priv)** at startup and writes a warning to the error log if the value is insecure. A non-**NULL** value is considered insecure if it is empty, or the value is the data directory or a subdirectory of it, or a directory that is accessible by all users. If **[secure\_file\_priv](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_secure_file_priv)** is set to a nonexistent path, the server writes an error message to the error log and exits.

* **[select\_into\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_select_into_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--select-into-buffer-size=#** |
| **Introduced** | 8.0.22 |
| **System Variable** | [**select\_into\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_buffer_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **131072** |
| **Minimum Value** | **8192** |
| **Maximum Value** | **2147479552** |
| **Unit** | **bytes** |
| **Block Size** | **4096** |

* When using [**SELECT INTO OUTFILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select-into) or **SELECT INTO DUMPFILE** to dump data into one or more files for backup creation, data migration, or other purposes, writes can often be buffered and then trigger a large burst of write I/O activity to the disk or other storage device and stall other queries that are more sensitive to latency. You can use this variable to control the size of the buffer used to write data to the storage device to determine when buffer synchronization should occur, and thus to prevent write stalls of the kind just described from occurring.
* **select\_into\_buffer\_size** overrides any value set for **[read\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_buffer_size)**. (**select\_into\_buffer\_size** and **read\_buffer\_size** have the same default, maximum, and minimum values.) You can also use **[select\_into\_disk\_sync\_delay](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_select_into_disk_sync_delay)** to set a timeout to be observed afterwards, each time synchronization takes place.
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[select\_into\_disk\_sync](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_select_into_disk_sync)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--select-into-disk-sync={ON|OFF}** |
| **Introduced** | 8.0.22 |
| **System Variable** | [**select\_into\_disk\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_disk_sync) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |
| **Valid Values** | **OFF**  **ON** |

* When set on **ON**, enables buffer synchronization of writes to an output file by a long-running [**SELECT INTO OUTFILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select-into) or **SELECT INTO DUMPFILE** statement using **[select\_into\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_select_into_buffer_size)**.

* **[select\_into\_disk\_sync\_delay](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_select_into_disk_sync_delay)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--select-into-disk-sync-delay=#** |
| **Introduced** | 8.0.22 |
| **System Variable** | [**select\_into\_disk\_sync\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_disk_sync_delay) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **31536000** |
| **Unit** | **milliseconds** |

* When buffer synchronization of writes to an output file by a long-running [**SELECT INTO OUTFILE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select-into) or **SELECT INTO DUMPFILE** statement is enabled by **[select\_into\_disk\_sync](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_select_into_disk_sync)**, this variable sets an optional delay (in milliseconds) following synchronization. **0** (the default) means no delay.
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[session\_track\_gtids](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_gtids)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--session-track-gtids=value** |
| **System Variable** | [**session\_track\_gtids**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_gtids) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **OFF** |
| **Valid Values** | **OFF**  **OWN\_GTID**  **ALL\_GTIDS** |

* Controls whether the server returns GTIDs to the client, enabling the client to use them to track the server state. Depending on the variable value, at the end of executing each transaction, the server’s GTIDs are captured and returned to the client as part of the acknowledgement. The possible values for **[session\_track\_gtids](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_gtids)** are as follows:
  + **OFF**: The server does not return GTIDs to the client. This is the default.
  + **OWN\_GTID**: The server returns the GTIDs for all transactions that were successfully committed by this client in its current session since the last acknowledgement. Typically, this is the single GTID for the last transaction committed, but if a single client request resulted in multiple transactions, the server returns a GTID set containing all the relevant GTIDs.
  + **ALL\_GTIDS**: The server returns the global value of its **[gtid\_executed](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_gtid_executed)** system variable, which it reads at a point after the transaction is successfully committed. As well as the GTID for the transaction just committed, this GTID set includes all transactions committed on the server by any client, and can include transactions committed after the point when the transaction currently being acknowledged was committed.

[**session\_track\_gtids**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_gtids) cannot be set within transactional context.

For more information about session state tracking, see [Section 5.1.18, “Server Tracking of Client Session State Changes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#session-state-tracking).

* **[session\_track\_schema](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_schema)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--session-track-schema[={OFF|ON}]** |
| **System Variable** | [**session\_track\_schema**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_schema) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* Controls whether the server tracks when the default schema (database) is set within the current session and notifies the client to make the schema name available.
* If the schema name tracker is enabled, name notification occurs each time the default schema is set, even if the new schema name is the same as the old.
* For more information about session state tracking, see [Section 5.1.18, “Server Tracking of Client Session State Changes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#session-state-tracking).

* **[session\_track\_state\_change](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_state_change)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--session-track-state-change[={OFF|ON}]** |
| **System Variable** | [**session\_track\_state\_change**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_state_change) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Controls whether the server tracks changes to the state of the current session and notifies the client when state changes occur. Changes can be reported for these attributes of client session state:
  + The default schema (database).
  + Session-specific values for system variables.
  + User-defined variables.
  + Temporary tables.
  + Prepared statements.

If the session state tracker is enabled, notification occurs for each change that involves tracked session attributes, even if the new attribute values are the same as the old. For example, setting a user-defined variable to its current value results in a notification.

The **[session\_track\_state\_change](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_state_change)** variable controls only notification of when changes occur, not what the changes are. For example, state-change notifications occur when the default schema is set or tracked session system variables are assigned, but the notification does not include the schema name or variable values. To receive notification of the schema name or session system variable values, use the [**session\_track\_schema**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_schema) or [**session\_track\_system\_variables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_system_variables) system variable, respectively.

**Note**

Assigning a value to **[session\_track\_state\_change](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_state_change)** itself is not considered a state change and is not reported as such. However, if its name listed in the value of **[session\_track\_system\_variables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_system_variables)**, any assignments to it do result in notification of the new value.

For more information about session state tracking, see [Section 5.1.18, “Server Tracking of Client Session State Changes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#session-state-tracking).

* **[session\_track\_system\_variables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_system_variables)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--session-track-system-variables=#** |
| **System Variable** | [**session\_track\_system\_variables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_system_variables) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **time\_zone, autocommit, character\_set\_client, character\_set\_results, character\_set\_connection** |

* Controls whether the server tracks assignments to session system variables and notifies the client of the name and value of each assigned variable. The variable value is a comma-separated list of variables for which to track assignments. By default, notification is enabled for [**time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_time_zone), [**autocommit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_autocommit), [**character\_set\_client**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_client), [**character\_set\_results**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_results), and **[character\_set\_connection](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_connection)**. (The latter three variables are those affected by [**SET NAMES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-names).)
* The special value **\*** causes the server to track assignments to all session variables. If given, this value must be specified by itself without specific system variable names.
* To disable notification of session variable assignments, set **[session\_track\_system\_variables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_system_variables)** to the empty string.
* If session system variable tracking is enabled, notification occurs for all assignments to tracked session variables, even if the new values are the same as the old.
* For more information about session state tracking, see [Section 5.1.18, “Server Tracking of Client Session State Changes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#session-state-tracking).

* **[session\_track\_transaction\_info](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_transaction_info)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--session-track-transaction-info=value** |
| **System Variable** | [**session\_track\_transaction\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_transaction_info) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **OFF** |
| **Valid Values** | **OFF**  **STATE**  **CHARACTERISTICS** |

* Controls whether the server tracks the state and characteristics of transactions within the current session and notifies the client to make this information available. These **[session\_track\_transaction\_info](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_transaction_info)** values are permitted:
  + **OFF**: Disable transaction state tracking. This is the default.
  + **STATE**: Enable transaction state tracking without characteristics tracking. State tracking enables the client to determine whether a transaction is in progress and whether it could be moved to a different session without being rolled back.
  + **CHARACTERISTICS**: Enable transaction state tracking, including characteristics tracking. Characteristics tracking enables the client to determine how to restart a transaction in another session so that it has the same characteristics as in the original session. The following characteristics are relevant for this purpose:
  + ISOLATION LEVEL
  + READ ONLY
  + READ WRITE
  + WITH CONSISTENT SNAPSHOT

For a client to safely relocate a transaction to another session, it must track not only transaction state but also transaction characteristics. In addition, the client must track the **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)** and **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)** system variables to correctly determine the session defaults. (To track these variables, list them in the value of the **[session\_track\_system\_variables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_system_variables)** system variable.)

For more information about session state tracking, see [Section 5.1.18, “Server Tracking of Client Session State Changes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#session-state-tracking).

* **[sha256\_password\_auto\_generate\_rsa\_keys](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sha256_password_auto_generate_rsa_keys)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--sha256-password-auto-generate-rsa-keys[={OFF|ON}]** |
| **System Variable** | [**sha256\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_auto_generate_rsa_keys) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* The server uses this variable to determine whether to autogenerate RSA private/public key-pair files in the data directory if they do not already exist.
* At startup, the server automatically generates RSA private/public key-pair files in the data directory if all of these conditions are true: The [**sha256\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_auto_generate_rsa_keys) or [**caching\_sha2\_password\_auto\_generate\_rsa\_keys**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_auto_generate_rsa_keys) system variable is enabled; no RSA options are specified; the RSA files are missing from the data directory. These key-pair files enable secure password exchange using RSA over unencrypted connections for accounts authenticated by the **sha256\_password** or **caching\_sha2\_password** plugin; see [Section 6.4.1.3, “SHA-256 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sha256-pluggable-authentication), and [Section 6.4.1.2, “Caching SHA-2 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#caching-sha2-pluggable-authentication).
* For more information about RSA file autogeneration, including file names and characteristics, see [Section 6.3.3.1, “Creating SSL and RSA Certificates and Keys using MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#creating-ssl-rsa-files-using-mysql)
* The **[auto\_generate\_certs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_auto_generate_certs)** system variable is related but controls autogeneration of SSL certificate and key files needed for secure connections using SSL.

* **[sha256\_password\_private\_key\_path](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sha256_password_private_key_path)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--sha256-password-private-key-path=file\_name** |
| **System Variable** | [**sha256\_password\_private\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_private_key_path) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **private\_key.pem** |

* The value of this variable is the path name of the RSA private key file for the **sha256\_password** authentication plugin. If the file is named as a relative path, it is interpreted relative to the server data directory. The file must be in PEM format.
* **Important**
* Because this file stores a private key, its access mode should be restricted so that only the MySQL server can read it.
* For information about **sha256\_password**, see [Section 6.4.1.3, “SHA-256 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sha256-pluggable-authentication).

* **[sha256\_password\_proxy\_users](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sha256_password_proxy_users)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--sha256-password-proxy-users[={OFF|ON}]** |
| **System Variable** | [**sha256\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_proxy_users) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable controls whether the **sha256\_password** built-in authentication plugin supports proxy users. It has no effect unless the **[check\_proxy\_users](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_check_proxy_users)** system variable is enabled. For information about user proxying, see [Section 6.2.18, “Proxy Users”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#proxy-users).

* **[sha256\_password\_public\_key\_path](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sha256_password_public_key_path)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--sha256-password-public-key-path=file\_name** |
| **System Variable** | [**sha256\_password\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_public_key_path) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **public\_key.pem** |

* The value of this variable is the path name of the RSA public key file for the **sha256\_password** authentication plugin. If the file is named as a relative path, it is interpreted relative to the server data directory. The file must be in PEM format. Because this file stores a public key, copies can be freely distributed to client users. (Clients that explicitly specify a public key when connecting to the server using RSA password encryption must use the same public key as that used by the server.)
* For information about **sha256\_password**, including information about how clients specify the RSA public key, see [Section 6.4.1.3, “SHA-256 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sha256-pluggable-authentication).

* **[shared\_memory](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_shared_memory)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--shared-memory[={OFF|ON}]** |
| **System Variable** | [**shared\_memory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_shared_memory) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Platform Specific** | Windows |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* (Windows only.) Whether the server permits shared-memory connections.

* **[shared\_memory\_base\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_shared_memory_base_name)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--shared-memory-base-name=name** |
| **System Variable** | [**shared\_memory\_base\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_shared_memory_base_name) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Platform Specific** | Windows |
| **Type** | String |
| **Default Value** | **MYSQL** |

* (Windows only.) The name of shared memory to use for shared-memory connections. This is useful when running multiple MySQL instances on a single physical machine. The default name is **MYSQL**. The name is case-sensitive.
* This variable applies only if the server is started with the **[shared\_memory](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_shared_memory)** system variable enabled to support shared-memory connections.

* **[show\_create\_table\_skip\_secondary\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_show_create_table_skip_secondary_engine)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--show-create-table-skip-secondary-engine[={OFF|ON}]** |
| **Introduced** | 8.0.18 |
| **System Variable** | [**show\_create\_table\_skip\_secondary\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_create_table_skip_secondary_engine) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Enabling **[show\_create\_table\_skip\_secondary\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_show_create_table_skip_secondary_engine)** causes the **SECONDARY ENGINE** clause to be excluded from [**SHOW CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-table) output, and from [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) statements dumped by the **[mysqldump](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqldump" \o "4.5.4 mysqldump — A Database Backup Program)** utility.
* [**mysqldump**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysqldump) provides the [--show-create-skip-secondary-engine](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysqldump_show-create-skip-secondary-engine) option. When specified, it enables the **[show\_create\_table\_skip\_secondary\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_show_create_table_skip_secondary_engine)** system variable for the duration of the dump operation.
* Attempting a **[mysqldump](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqldump" \o "4.5.4 mysqldump — A Database Backup Program)** operation with the [--show-create-skip-secondary-engine](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysqldump_show-create-skip-secondary-engine) option on a release prior to MySQL 8.0.18 that does not support the **[show\_create\_table\_skip\_secondary\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_show_create_table_skip_secondary_engine)** variable causes an error.
* For use with HeatWave. See [HeatWave User Guide](https://dev.mysql.com/doc/heatwave/en/" \t "_top).

* **[show\_create\_table\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_show_create_table_verbosity)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--show-create-table-verbosity[={OFF|ON}]** |
| **System Variable** | [**show\_create\_table\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_create_table_verbosity) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* [**SHOW CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-table) normally does not show the **ROW\_FORMAT** table option if the row format is the default format. Enabling this variable causes [**SHOW CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-table) to display **ROW\_FORMAT** regardless of whether it is the default format.

* **[show\_old\_temporals](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_show_old_temporals)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--show-old-temporals[={OFF|ON}]** |
| **Deprecated** | Yes |
| **System Variable** | [**show\_old\_temporals**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_old_temporals) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether [**SHOW CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-table) output includes comments to flag temporal columns found to be in pre-5.6.4 format ([**TIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#time), [**DATETIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime), and [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns without support for fractional seconds precision). This variable is disabled by default. If enabled, [**SHOW CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-table) output looks like this:
* CREATE TABLE `mytbl` (
* `ts` timestamp /\* 5.5 binary format \*/ NOT NULL DEFAULT CURRENT\_TIMESTAMP,
* `dt` datetime /\* 5.5 binary format \*/ DEFAULT NULL,
* `t` time /\* 5.5 binary format \*/ DEFAULT NULL
* ) DEFAULT CHARSET=utf8mb4
* Output for the **COLUMN\_TYPE** column of the [**INFORMATION\_SCHEMA.COLUMNS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-columns-table) table is affected similarly.
* This variable is deprecated and subject to removal in a future MySQL release.
* As of MySQL 8.0.26, setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[skip\_external\_locking](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_external_locking)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-external-locking[={OFF|ON}]** |
| **System Variable** | [**skip\_external\_locking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_external_locking) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* This is **OFF** if **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** uses external locking (system locking), **ON** if external locking is disabled. This affects only **[MyISAM](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\storage-engines.html" \l "myisam-storage-engine" \o "16.2 The MyISAM Storage Engine)** table access.
* This variable is set by the [--external-locking](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_external-locking) or [--skip-external-locking](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_external-locking) option. External locking is disabled by default.
* External locking affects only **[MyISAM](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\storage-engines.html" \l "myisam-storage-engine" \o "16.2 The MyISAM Storage Engine)** table access. For more information, including conditions under which it can and cannot be used, see [Section 8.11.5, “External Locking”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#external-locking).

* **[skip\_name\_resolve](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_name_resolve)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-name-resolve[={OFF|ON}]** |
| **System Variable** | [**skip\_name\_resolve**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_name_resolve) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether to resolve host names when checking client connections. If this variable is **OFF**, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** resolves host names when checking client connections. If it is **ON**, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** uses only IP numbers; in this case, all **Host** column values in the grant tables must be IP addresses. See [Section 5.1.12.3, “DNS Lookups and the Host Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache).
* Depending on the network configuration of your system and the **Host** values for your accounts, clients may need to connect using an explicit [--host](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_host) option, such as [--host=127.0.0.1](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_host) or [--host=::1](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_host).
* An attempt to connect to the host **127.0.0.1** normally resolves to the **localhost** account. However, this fails if the server is run with **[skip\_name\_resolve](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_name_resolve)** enabled. If you plan to do that, make sure an account exists that can accept a connection. For example, to be able to connect as **root** using [--host=127.0.0.1](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_host) or [--host=::1](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_host), create these accounts:
* CREATE USER 'root'@'127.0.0.1' IDENTIFIED BY '***root-password***';
* CREATE USER 'root'@'::1' IDENTIFIED BY '***root-password***';

* **[skip\_networking](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_networking)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-networking[={OFF|ON}]** |
| **System Variable** | [**skip\_networking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_networking) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable controls whether the server permits TCP/IP connections. By default, it is disabled (permit TCP connections). If enabled, the server permits only local (non-TCP/IP) connections and all interaction with **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** must be made using named pipes or shared memory (on Windows) or Unix socket files (on Unix). This option is highly recommended for systems where only local clients are permitted. See [Section 5.1.12.3, “DNS Lookups and the Host Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache).
* Because starting the server with [--skip-grant-tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-grant-tables) disables authentication checks, the server also disables remote connections in that case by enabling **[skip\_networking](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_networking)**.

* **[skip\_show\_database](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_show_database)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--skip-show-database** |
| **System Variable** | [**skip\_show\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_skip_show_database) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This prevents people from using the [**SHOW DATABASES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-databases) statement if they do not have the [**SHOW DATABASES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_show-databases) privilege. This can improve security if you have concerns about users being able to see databases belonging to other users. Its effect depends on the [**SHOW DATABASES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_show-databases) privilege: If the variable value is **ON**, the [**SHOW DATABASES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-databases) statement is permitted only to users who have the [**SHOW DATABASES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_show-databases) privilege, and the statement displays all database names. If the value is **OFF**, [**SHOW DATABASES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-databases) is permitted to all users, but displays the names of only those databases for which the user has the [**SHOW DATABASES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_show-databases) or other privilege.
* **Caution**
* Because any static global privilege is considered a privilege for all databases, any static global privilege enables a user to see all database names with [**SHOW DATABASES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-databases) or by examining the [**SCHEMATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-schemata-table) table of **INFORMATION\_SCHEMA**, except databases that have been restricted at the database level by partial revokes.

* **[slow\_launch\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_launch_time)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--slow-launch-time=#** |
| **System Variable** | [**slow\_launch\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_launch_time) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **2** |

* If creating a thread takes longer than this many seconds, the server increments the **[Slow\_launch\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Slow_launch_threads)** status variable.

* **[slow\_query\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--slow-query-log[={OFF|ON}]** |
| **System Variable** | [**slow\_query\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the slow query log is enabled. The value can be 0 (or **OFF**) to disable the log or 1 (or **ON**) to enable the log. The destination for log output is controlled by the **[log\_output](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_output)** system variable; if that value is **NONE**, no log entries are written even if the log is enabled.
* “Slow” is determined by the value of the **[long\_query\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_long_query_time)** variable. See [Section 5.4.5, “The Slow Query Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#slow-query-log).

* **[slow\_query\_log\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log_file)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--slow-query-log-file=file\_name** |
| **System Variable** | [**slow\_query\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log_file) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **host\_name-slow.log** |

* The name of the slow query log file. The default value is ***host\_name***-slow.log, but the initial value can be changed with the **--slow\_query\_log\_file** option.

* **[socket](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_socket)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--socket={file\_name|pipe\_name}** |
| **System Variable** | [**socket**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_socket) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value (Windows)** | **MySQL** |
| **Default Value (Other)** | **/tmp/mysql.sock** |

* On Unix platforms, this variable is the name of the socket file that is used for local client connections. The default is /tmp/mysql.sock. (For some distribution formats, the directory might be different, such as /var/lib/mysql for RPMs.)
* On Windows, this variable is the name of the named pipe that is used for local client connections. The default value is **MySQL** (not case-sensitive).

* **[sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sort_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--sort-buffer-size=#** |
| **System Variable** | [**sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sort_buffer_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **262144** |
| **Minimum Value** | **32768** |
| **Maximum Value (Windows)** | **4294967295** |
| **Maximum Value (Other, 64-bit platforms)** | **18446744073709551615** |
| **Maximum Value (Other, 32-bit platforms)** | **4294967295** |

* Each session that must perform a sort allocates a buffer of this size. **[sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sort_buffer_size)** is not specific to any storage engine and applies in a general manner for optimization. At minimum the **[sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sort_buffer_size)** value must be large enough to accommodate fifteen tuples in the sort buffer. Also, increasing the value of **[max\_sort\_length](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_sort_length)** may require increasing the value of **[sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sort_buffer_size)**. For more information, see [Section 8.2.1.16, “ORDER BY Optimization”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#order-by-optimization)
* If you see many **[Sort\_merge\_passes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Sort_merge_passes)** per second in [**SHOW GLOBAL STATUS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-status) output, you can consider increasing the **[sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sort_buffer_size)** value to speed up **ORDER BY** or **GROUP BY** operations that cannot be improved with query optimization or improved indexing.
* The optimizer tries to work out how much space is needed but can allocate more, up to the limit. Setting it larger than required globally slows down most queries that perform sorts. It is best to increase it as a session setting, and only for the sessions that need a larger size. On Linux, there are thresholds of 256KB and 2MB where larger values may significantly slow down memory allocation, so you should consider staying below one of those values. Experiment to find the best value for your workload. See [Section B.3.3.5, “Where MySQL Stores Temporary Files”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#temporary-files).
* The maximum permissible setting for **[sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sort_buffer_size)** is 4GB−1. Larger values are permitted for 64-bit platforms (except 64-bit Windows, for which large values are truncated to 4GB−1 with a warning).

* **[sql\_auto\_is\_null](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_auto_is_null)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_auto\_is\_null**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_auto_is_null) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If this variable is enabled, then after a statement that successfully inserts an automatically generated **AUTO\_INCREMENT** value, you can find that value by issuing a statement of the following form:
* SELECT \* FROM ***tbl\_name*** WHERE ***auto\_col*** IS NULL
* If the statement returns a row, the value returned is the same as if you invoked the [**LAST\_INSERT\_ID()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_last-insert-id) function. For details, including the return value after a multiple-row insert, see [Section 12.16, “Information Functions”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#information-functions). If no **AUTO\_INCREMENT** value was successfully inserted, the [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statement returns no row.
* The behavior of retrieving an **AUTO\_INCREMENT** value by using an [**IS NULL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_is-null) comparison is used by some ODBC programs, such as Access. See [Obtaining Auto-Increment Values](https://dev.mysql.com/doc/connector-odbc/en/connector-odbc-usagenotes-functionality-last-insert-id.html). This behavior can be disabled by setting **[sql\_auto\_is\_null](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_auto_is_null)** to **OFF**.
* Prior to MySQL 8.0.16, the transformation of **WHERE *auto\_col* IS NULL** to **WHERE *auto\_col* = LAST\_INSERT\_ID()** was performed only when the statement was executed, so that the value of **sql\_auto\_is\_null** during execution determined whether the query was transformed. In MySQL 8.0.16 and later, the transformation is performed during statement preparation.
* The default value of **[sql\_auto\_is\_null](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_auto_is_null)** is **OFF**.

* **[sql\_big\_selects](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_big_selects)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_big\_selects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_big_selects) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **ON** |

* If set to **OFF**, MySQL aborts [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements that are likely to take a very long time to execute (that is, statements for which the optimizer estimates that the number of examined rows exceeds the value of **[max\_join\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_join_size)**). This is useful when an inadvisable **WHERE** statement has been issued. The default value for a new connection is **ON**, which permits all [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements.
* If you set the **[max\_join\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_join_size)** system variable to a value other than **DEFAULT**, **[sql\_big\_selects](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_big_selects)** is set to **OFF**.

* **[sql\_buffer\_result](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_buffer_result)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_buffer\_result**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_buffer_result) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If enabled, **[sql\_buffer\_result](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_buffer_result)** forces results from [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements to be put into temporary tables. This helps MySQL free the table locks early and can be beneficial in cases where it takes a long time to send results to the client. The default value is **OFF**.

* **[sql\_log\_off](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_log_off)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_log\_off**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_log_off) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |
| **Valid Values** | **OFF** (enable logging)  **ON** (disable logging) |

* This variable controls whether logging to the general query log is disabled for the current session (assuming that the general query log itself is enabled). The default value is **OFF** (that is, enable logging). To disable or enable general query logging for the current session, set the session **[sql\_log\_off](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_log_off)** variable to **ON** or **OFF**.
* Setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

* **[sql\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_mode)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--sql-mode=name** |
| **System Variable** | [**sql\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_mode) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Set |
| **Default Value** | **ONLY\_FULL\_GROUP\_BY STRICT\_TRANS\_TABLES NO\_ZERO\_IN\_DATE NO\_ZERO\_DATE ERROR\_FOR\_DIVISION\_BY\_ZERO NO\_ENGINE\_SUBSTITUTION** |
| **Valid Values** | **ALLOW\_INVALID\_DATES**  **ANSI\_QUOTES**  **ERROR\_FOR\_DIVISION\_BY\_ZERO**  **HIGH\_NOT\_PRECEDENCE**  **IGNORE\_SPACE**  **NO\_AUTO\_VALUE\_ON\_ZERO**  **NO\_BACKSLASH\_ESCAPES**  **NO\_DIR\_IN\_CREATE**  **NO\_ENGINE\_SUBSTITUTION**  **NO\_UNSIGNED\_SUBTRACTION**  **NO\_ZERO\_DATE**  **NO\_ZERO\_IN\_DATE**  **ONLY\_FULL\_GROUP\_BY**  **PAD\_CHAR\_TO\_FULL\_LENGTH**  **PIPES\_AS\_CONCAT**  **REAL\_AS\_FLOAT**  **STRICT\_ALL\_TABLES**  **STRICT\_TRANS\_TABLES**  **TIME\_TRUNCATE\_FRACTIONAL** |

* The current server SQL mode, which can be set dynamically. For details, see [Section 5.1.11, “Server SQL Modes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode).
* **Note**
* MySQL installation programs may configure the SQL mode during the installation process.
* If the SQL mode differs from the default or from what you expect, check for a setting in an option file that the server reads at startup.

* **[sql\_notes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_notes)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_notes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_notes) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* If enabled (the default), diagnostics of **Note** level increment **warning\_count** and the server records them. If disabled, **Note** diagnostics do not increment **[warning\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_warning_count)** and the server does not record them. **[mysqldump](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqldump" \o "4.5.4 mysqldump — A Database Backup Program)** includes output to disable this variable so that reloading the dump file does not produce warnings for events that do not affect the integrity of the reload operation.

* **[sql\_quote\_show\_create](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_quote_show_create)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_quote\_show\_create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_quote_show_create) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* If enabled (the default), the server quotes identifiers for [**SHOW CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-table) and [**SHOW CREATE DATABASE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-database) statements. If disabled, quoting is disabled. This option is enabled by default so that replication works for identifiers that require quoting. See [Section 13.7.7.10, “SHOW CREATE TABLE Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-table), and [Section 13.7.7.6, “SHOW CREATE DATABASE Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-create-database).

* **[sql\_require\_primary\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_require_primary_key)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--sql-require-primary-key[={OFF|ON}]** |
| **Introduced** | 8.0.13 |
| **System Variable** | [**sql\_require\_primary\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_require_primary_key) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether statements that create new tables or alter the structure of existing tables enforce the requirement that tables have a primary key.
* Setting the session value of this system variable is a restricted operation. The session user must have privileges sufficient to set restricted session variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).
* Enabling this variable helps avoid performance problems in row-based replication that can occur when tables have no primary key. Suppose that a table has no primary key and an update or delete modifies multiple rows. On the replication source server, this operation can be performed using a single table scan but, when replicated using row-based replication, results in a table scan for each row to be modified on the replica. With a primary key, these table scans do not occur.
* [**sql\_require\_primary\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_require_primary_key) applies to both base tables and **TEMPORARY** tables, and changes to its value are replicated to replica servers. As of MySQL 8.0.18, it applies only to storage engines that can participate in replication.
* When enabled, **[sql\_require\_primary\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_require_primary_key)** has these effects:
  + Attempts to create a new table with no primary key fail with an error. This includes **CREATE TABLE ... LIKE**. It also includes **CREATE TABLE ... SELECT**, unless the **CREATE TABLE** part includes a primary key definition.
  + Attempts to drop the primary key from an existing table fail with an error, with the exception that dropping the primary key and adding a primary key in the same **ALTER TABLE** statement is permitted.

Dropping the primary key fails even if the table also contains a **UNIQUE NOT NULL** index.

* + Attempts to import a table with no primary key fail with an error.

The **REQUIRE\_TABLE\_PRIMARY\_KEY\_CHECK** option of the [**CHANGE REPLICATION SOURCE TO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#change-replication-source-to) statement (from MySQL 8.0.23) or [**CHANGE MASTER TO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#change-master-to) statement (before MySQL 8.0.23) enables a replica to select its own policy for primary key checks. When the option is set to **ON** for a replication channel, the replica always uses the value **ON** for the **[sql\_require\_primary\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_require_primary_key)** system variable in replication operations, requiring a primary key. When the option is set to **OFF**, the replica always uses the value **OFF** for the **[sql\_require\_primary\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_require_primary_key)** system variable in replication operations, so that a primary key is never required, even if the source required one. When the **REQUIRE\_TABLE\_PRIMARY\_KEY\_CHECK** option is set to **STREAM**, which is the default, the replica uses whatever value is replicated from the source for each transaction. With the **STREAM** setting for the **REQUIRE\_TABLE\_PRIMARY\_KEY\_CHECK** option, if privilege checks are in use for the replication channel, the **PRIVILEGE\_CHECKS\_USER** account needs privileges sufficient to set restricted session variables, so that it can set the session value for the **[sql\_require\_primary\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_require_primary_key)** system variable. With the **ON** or **OFF** settings, the account does not need these privileges. For more information, see [Section 17.3.3, “Replication Privilege Checks”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-privilege-checks).

* **[sql\_safe\_updates](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_safe_updates)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_safe\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_safe_updates) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If this variable is enabled, [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) and [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete) statements that do not use a key in the **WHERE** clause or a **LIMIT** clause produce an error. This makes it possible to catch [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) and [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete) statements where keys are not used properly and that would probably change or delete a large number of rows. The default value is **OFF**.
* For the **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** client, **[sql\_safe\_updates](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_safe_updates)** can be enabled by using the [--safe-updates](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysql_safe-updates) option. For more information, see [Using Safe-Updates Mode (--safe-updates)](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#safe-updates).

* **[sql\_select\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_select_limit)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_select\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_select_limit) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |

* The maximum number of rows to return from [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements. For more information, see [Using Safe-Updates Mode (--safe-updates)](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#safe-updates).
* The default value for a new connection is the maximum number of rows that the server permits per table. Typical default values are (232)−1 or (264)−1. If you have changed the limit, the default value can be restored by assigning a value of **DEFAULT**.
* If a [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) has a **LIMIT** clause, the **LIMIT** takes precedence over the value of **[sql\_select\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_select_limit)**.

* **[sql\_warnings](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_warnings)**

|  |  |
| --- | --- |
| **System Variable** | [**sql\_warnings**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_warnings) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* This variable controls whether single-row [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert) statements produce an information string if warnings occur. The default is **OFF**. Set the value to **ON** to produce an information string.

* **[ssl\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_ca)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl-ca=file\_name** |
| **System Variable** | [**ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_ca) |
| **Scope** | Global |
| **Dynamic (≥ 8.0.16)** | Yes |
| **Dynamic (≤ 8.0.15)** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **NULL** |

* The path name of the Certificate Authority (CA) certificate file in PEM format. The file contains a list of trusted SSL Certificate Authorities.
* As of MySQL 8.0.16, this variable is dynamic and can be modified at runtime to affect the TSL context the server uses for new connections. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration). Prior to MySQL 8.0.16, this variable can be set only at server startup.

* **[ssl\_capath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_capath)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl-capath=dir\_name** |
| **System Variable** | [**ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_capath) |
| **Scope** | Global |
| **Dynamic (≥ 8.0.16)** | Yes |
| **Dynamic (≤ 8.0.15)** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **NULL** |

* The path name of the directory that contains trusted SSL Certificate Authority (CA) certificate files in PEM format.
* As of MySQL 8.0.16, this variable is dynamic and can be modified at runtime to affect the TSL context the server uses for new connections. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration). Prior to MySQL 8.0.16, this variable can be set only at server startup.

* **[ssl\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_cert)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl-cert=file\_name** |
| **System Variable** | [**ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_cert) |
| **Scope** | Global |
| **Dynamic (≥ 8.0.16)** | Yes |
| **Dynamic (≤ 8.0.15)** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **NULL** |

* The path name of the server SSL public key certificate file in PEM format.
* If the server is started with **[ssl\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_cert)** set to a certificate that uses any restricted cipher or cipher category, the server starts with support for encrypted connections disabled. For information about cipher restrictions, see [Connection Cipher Configuration](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#encrypted-connection-cipher-configuration).
* As of MySQL 8.0.16, this variable is dynamic and can be modified at runtime to affect the TSL context the server uses for new connections. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration). Prior to MySQL 8.0.16, this variable can be set only at server startup.

* **[ssl\_cipher](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_cipher)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl-cipher=name** |
| **System Variable** | [**ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_cipher) |
| **Scope** | Global |
| **Dynamic (≥ 8.0.16)** | Yes |
| **Dynamic (≤ 8.0.15)** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **NULL** |

* The list of permissible encryption ciphers for connections that use TLS protocols up through TLSv1.2. If no cipher in the list is supported, encrypted connections that use these TLS protocols do not work.
* For greatest portability, the cipher list should be a list of one or more cipher names, separated by colons. Examples:
* [mysqld]
* ssl\_cipher="AES128-SHA"
* ssl\_cipher="DHE-RSA-AES128-GCM-SHA256:AES128-SHA"
* OpenSSL supports the syntax for specifying ciphers described in the OpenSSL documentation at <https://www.openssl.org/docs/manmaster/man1/ciphers.html>.
* For information about which encryption ciphers MySQL supports, see [Section 6.3.2, “Encrypted Connection TLS Protocols and Ciphers”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#encrypted-connection-protocols-ciphers).
* As of MySQL 8.0.16, this variable is dynamic and can be modified at runtime to affect the TSL context the server uses for new connections. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration). Prior to MySQL 8.0.16, this variable can be set only at server startup.

* **[ssl\_crl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_crl)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl-crl=file\_name** |
| **System Variable** | [**ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_crl) |
| **Scope** | Global |
| **Dynamic (≥ 8.0.16)** | Yes |
| **Dynamic (≤ 8.0.15)** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **NULL** |

* The path name of the file containing certificate revocation lists in PEM format.
* As of MySQL 8.0.16, this variable is dynamic and can be modified at runtime to affect the TSL context the server uses for new connections. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration). Prior to MySQL 8.0.16, this variable can be set only at server startup.

* **[ssl\_crlpath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_crlpath)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl-crlpath=dir\_name** |
| **System Variable** | [**ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_crlpath) |
| **Scope** | Global |
| **Dynamic (≥ 8.0.16)** | Yes |
| **Dynamic (≤ 8.0.15)** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **NULL** |

* The path of the directory that contains certificate revocation-list files in PEM format.
* As of MySQL 8.0.16, this variable is dynamic and can be modified at runtime to affect the TSL context the server uses for new connections. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration). Prior to MySQL 8.0.16, this variable can be set only at server startup.

* **[ssl\_fips\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_fips_mode)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl-fips-mode={OFF|ON|STRICT}** |
| **System Variable** | [**ssl\_fips\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_fips_mode) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **OFF** |
| **Valid Values** | **OFF** (or 0)  **ON** (or 1)  **STRICT** (or 2) |

* Controls whether to enable FIPS mode on the server side. The **[ssl\_fips\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_fips_mode)** system variable differs from other **ssl\_*xxx*** system variables in that it is not used to control whether the server permits encrypted connections, but rather to affect which cryptographic operations are permitted. See [Section 6.8, “FIPS Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#fips-mode).
* These **[ssl\_fips\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_fips_mode)** values are permitted:
  + **OFF** (or 0): Disable FIPS mode.
  + **ON** (or 1): Enable FIPS mode.
  + **STRICT** (or 2): Enable “strict” FIPS mode.

**Note**

If the OpenSSL FIPS Object Module is not available, the only permitted value for **[ssl\_fips\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_fips_mode)** is **OFF**. In this case, setting **[ssl\_fips\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_fips_mode)** to **ON** or **STRICT** at startup causes the server to produce an error message and exit.

* **[ssl\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_key)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--ssl-key=file\_name** |
| **System Variable** | [**ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_key) |
| **Scope** | Global |
| **Dynamic (≥ 8.0.16)** | Yes |
| **Dynamic (≤ 8.0.15)** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **NULL** |

* The path name of the server SSL private key file in PEM format. For better security, use a certificate with an RSA key size of at least 2048 bits.
* If the key file is protected by a passphrase, the server prompts the user for the passphrase. The password must be given interactively; it cannot be stored in a file. If the passphrase is incorrect, the program continues as if it could not read the key.
* As of MySQL 8.0.16, this variable is dynamic and can be modified at runtime to affect the TSL context the server uses for new connections. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration). Prior to MySQL 8.0.16, this variable can be set only at server startup.

* **[stored\_program\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_stored_program_cache)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--stored-program-cache=#** |
| **System Variable** | [**stored\_program\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_stored_program_cache) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **256** |
| **Minimum Value** | **16** |
| **Maximum Value** | **524288** |

* Sets a soft upper limit for the number of cached stored routines per connection. The value of this variable is specified in terms of the number of stored routines held in each of the two caches maintained by the MySQL Server for, respectively, stored procedures and stored functions.
* Whenever a stored routine is executed this cache size is checked before the first or top-level statement in the routine is parsed; if the number of routines of the same type (stored procedures or stored functions according to which is being executed) exceeds the limit specified by this variable, the corresponding cache is flushed and memory previously allocated for cached objects is freed. This allows the cache to be flushed safely, even when there are dependencies between stored routines.
* The stored procedure and stored function caches exists in parallel with the stored program definition cache partition of the [dictionary object cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_dictionary_object_cache). The stored procedure and stored function caches are per connection, while the stored program definition cache is shared. The existence of objects in the stored procedure and stored function caches have no dependence on the existence of objects in the stored program definition cache, and vice versa. For more information, see [Section 14.4, “Dictionary Object Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-dictionary.html#data-dictionary-object-cache).

* **[stored\_program\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_stored_program_definition_cache)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--stored-program-definition-cache=#** |
| **System Variable** | [**stored\_program\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_stored_program_definition_cache) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **256** |
| **Minimum Value** | **256** |
| **Maximum Value** | **524288** |

* Defines a limit for the number of stored program definition objects, both used and unused, that can be kept in the dictionary object cache.
* Unused stored program definition objects are only kept in the dictionary object cache when the number in use is less than the capacity defined by **stored\_program\_definition\_cache**.
* A setting of 0 means that stored program definition objects are only kept in the dictionary object cache while they are in use.
* The stored program definition cache partition exists in parallel with the stored procedure and stored function caches that are configured using the **[stored\_program\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_stored_program_cache)** option.
* The **[stored\_program\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_stored_program_cache)** option sets a soft upper limit for the number of cached stored procedures or functions per connection, and the limit is checked each time a connection executes a stored procedure or function. The stored program definition cache partition, on the other hand, is a shared cache that stores stored program definition objects for other purposes. The existence of objects in the stored program definition cache partition has no dependence on the existence of objects in the stored procedure cache or stored function cache, and vice versa.
* For related information, see [Section 14.4, “Dictionary Object Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-dictionary.html#data-dictionary-object-cache).

* **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--super-read-only[={OFF|ON}]** |
| **System Variable** | [**super\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_super_read_only) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* If the **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** system variable is enabled, the server permits no client updates except from users who have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege). If the **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)** system variable is also enabled, the server prohibits client updates even from users who have [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super). See the description of the **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** system variable for a description of read-only mode and information about how **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** and **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)** interact.
* Client updates prevented when **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)** is enabled include operations that do not necessarily appear to be updates, such as **CREATE FUNCTION** (to install a loadable function), **INSTALL PLUGIN**, and **INSTALL COMPONENT**. These operations are prohibited because they involve changes to tables in the **mysql** system schema.
* Changes to **[super\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_super_read_only)** on a replication source server are not replicated to replica servers. The value can be set on a replica independent of the setting on the source.

* **[syseventlog.facility](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_syseventlog.facility)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--syseventlog.facility=value** |
| **Introduced** | 8.0.13 |
| **System Variable** | [**syseventlog.facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.facility) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **daemon** |

* The facility for error log output written to **syslog** (what type of program is sending the message). This variable is unavailable unless the **log\_sink\_syseventlog** error log component is installed. See [Section 5.4.2.8, “Error Logging to the System Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-syslog).
* The permitted values can vary per operating system; consult your system **syslog** documentation.
* This variable does not exist on Windows.

* **[syseventlog.include\_pid](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_syseventlog.include_pid)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--syseventlog.include-pid[={OFF|ON}]** |
| **Introduced** | 8.0.13 |
| **System Variable** | [**syseventlog.include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.include_pid) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* Whether to include the server process ID in each line of error log output written to **syslog**. This variable is unavailable unless the **log\_sink\_syseventlog** error log component is installed. See [Section 5.4.2.8, “Error Logging to the System Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-syslog).
* This variable does not exist on Windows.

* **[syseventlog.tag](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_syseventlog.tag)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--syseventlog.tag=tag** |
| **Introduced** | 8.0.13 |
| **System Variable** | [**syseventlog.tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.tag) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **empty string** |

* The tag to be added to the server identifier in error log output written to **syslog** or the Windows Event Log. This variable is unavailable unless the **log\_sink\_syseventlog** error log component is installed. See [Section 5.4.2.8, “Error Logging to the System Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-syslog).
* By default, no tag is set, so the server identifier is simply **MySQL** on Windows, and **mysqld** on other platforms. If a tag value of ***tag*** is specified, it is appended to the server identifier with a leading hyphen, resulting in a **syslog** identifier of **mysqld-*tag*** (or **MySQL-*tag*** on Windows).
* On Windows, to use a tag that does not already exist, the server must be run from an account with Administrator privileges, to permit creation of a registry entry for the tag. Elevated privileges are not required if the tag already exists.

* **[system\_time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_system_time_zone)**

|  |  |
| --- | --- |
| **System Variable** | [**system\_time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_system_time_zone) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The server system time zone. When the server begins executing, it inherits a time zone setting from the machine defaults, possibly modified by the environment of the account used for running the server or the startup script. The value is used to set **[system\_time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_system_time_zone)**. Typically the time zone is specified by the **TZ** environment variable. It also can be specified using the [--timezone](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysqld_safe_timezone) option of the **[mysqld\_safe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld-safe" \o "4.3.2 mysqld_safe — MySQL Server Startup Script)** script.
* The **[system\_time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_system_time_zone)** variable differs from **[time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_time_zone)**. Although they might have the same value, the latter variable is used to initialize the time zone for each client that connects. See [Section 5.1.15, “MySQL Server Time Zone Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#time-zone-support).

* **[table\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_definition_cache)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--table-definition-cache=#** |
| **System Variable** | [**table\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_definition_cache) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **-1** (signifies autosizing; do not assign this literal value) |
| **Minimum Value** | **400** |
| **Maximum Value** | **524288** |

* The number of table definitions that can be stored in the definition cache. If you use a large number of tables, you can create a large table definition cache to speed up opening of tables. The table definition cache takes less space and does not use file descriptors, unlike the normal table cache. The minimum value is 400. The default value is based on the following formula, capped to a limit of 2000:
* MIN(400 + table\_open\_cache / 2, 2000)
* For **[InnoDB](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \o "Chapter 15 The InnoDB Storage Engine)**, **[table\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_definition_cache)** acts as a soft limit for the number of open table instances in the **InnoDB** data dictionary cache. If the number of open table instances exceeds the **[table\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_definition_cache)** setting, the LRU mechanism begins to mark table instances for eviction and eventually removes them from the data dictionary cache. The limit helps address situations in which significant amounts of memory would be used to cache rarely used table instances until the next server restart. The number of table instances with cached metadata could be higher than the limit defined by **[table\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_definition_cache)**, because parent and child table instances with foreign key relationships are not placed on the LRU list and are not subject to eviction from memory.
* Additionally, **[table\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_definition_cache)** defines a soft limit for the number of **[InnoDB](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \o "Chapter 15 The InnoDB Storage Engine)** file-per-table tablespaces that can be open at one time, which is also controlled by **[innodb\_open\_files](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_open_files)**. If both **[table\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_definition_cache)** and **[innodb\_open\_files](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_open_files)** are set, the highest setting is used. If neither variable is set, **[table\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_definition_cache)**, which has a higher default value, is used. If the number of open tablespace file handles exceeds the limit defined by **[table\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_definition_cache)** or **[innodb\_open\_files](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_open_files)**, the LRU mechanism searches the tablespace file LRU list for files that are fully flushed and are not currently being extended. This process is performed each time a new tablespace is opened. If there are no “inactive” tablespaces, no tablespace files are closed.
* The table definition cache exists in parallel with the table definition cache partition of the [dictionary object cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_dictionary_object_cache). Both caches store table definitions but serve different parts of the MySQL server. Objects in one cache have no dependence on the existence objects in the other. For more information, see [Section 14.4, “Dictionary Object Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-dictionary.html#data-dictionary-object-cache).

* **[table\_encryption\_privilege\_check](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_encryption_privilege_check)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--table-encryption-privilege-check[={OFF|ON}]** |
| **Introduced** | 8.0.16 |
| **System Variable** | [**table\_encryption\_privilege\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_encryption_privilege_check) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Controls the [**TABLE\_ENCRYPTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_table-encryption-admin) privilege check that occurs when creating or altering a schema or general tablespace with encryption that differs from the **[default\_table\_encryption](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_table_encryption)** setting, or when creating or altering a table with an encryption setting that differs from the default schema encryption. The check is disabled by default.
* Setting **[table\_encryption\_privilege\_check](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_encryption_privilege_check)** at runtime requires the [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege.
* [**table\_encryption\_privilege\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_encryption_privilege_check) supports [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) and [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) syntax. See [Section 5.1.9.3, “Persisted System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables).
* For more information, see [Defining an Encryption Default for Schemas and General Tablespaces](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-schema-tablespace-encryption-default).

* **[table\_open\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--table-open-cache=#** |
| **System Variable** | [**table\_open\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_open_cache) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **4000** |
| **Minimum Value** | **1** |
| **Maximum Value** | **524288** |

* The number of open tables for all threads. Increasing this value increases the number of file descriptors that **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** requires. You can check whether you need to increase the table cache by checking the **[Opened\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Opened_tables)** status variable. See [Section 5.1.10, “Server Status Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-status-variables). If the value of **[Opened\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Opened_tables)** is large and you do not use [**FLUSH TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-tables) often (which just forces all tables to be closed and reopened), then you should increase the value of the **[table\_open\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache)** variable. For more information about the table cache, see [Section 8.4.3.1, “How MySQL Opens and Closes Tables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#table-cache).

* **[table\_open\_cache\_instances](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache_instances)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--table-open-cache-instances=#** |
| **System Variable** | [**table\_open\_cache\_instances**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_open_cache_instances) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **16** |
| **Minimum Value** | **1** |
| **Maximum Value** | **64** |

* The number of open tables cache instances. To improve scalability by reducing contention among sessions, the open tables cache can be partitioned into several smaller cache instances of size **[table\_open\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache)** / **[table\_open\_cache\_instances](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache_instances)** . A session needs to lock only one instance to access it for DML statements. This segments cache access among instances, permitting higher performance for operations that use the cache when there are many sessions accessing tables. (DDL statements still require a lock on the entire cache, but such statements are much less frequent than DML statements.)
* A value of 8 or 16 is recommended on systems that routinely use 16 or more cores.

* **[tablespace\_definition\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tablespace_definition_cache)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--tablespace-definition-cache=#** |
| **System Variable** | [**tablespace\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tablespace_definition_cache) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **256** |
| **Minimum Value** | **256** |
| **Maximum Value** | **524288** |

* Defines a limit for the number of tablespace definition objects, both used and unused, that can be kept in the dictionary object cache.
* Unused tablespace definition objects are only kept in the dictionary object cache when the number in use is less than the capacity defined by **tablespace\_definition\_cache**.
* A setting of **0** means that tablespace definition objects are only kept in the dictionary object cache while they are in use.
* For more information, see [Section 14.4, “Dictionary Object Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-dictionary.html#data-dictionary-object-cache).

* **[temptable\_max\_mmap](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_temptable_max_mmap)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--temptable-max-mmap=#** |
| **Introduced** | 8.0.23 |
| **System Variable** | [**temptable\_max\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_max_mmap) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1073741824** |
| **Minimum Value** | **0** |
| **Maximum Value** | **2^64-1** |

* Defines the maximum amount of memory (in bytes) the TempTable storage engine is permitted to allocate from memory-mapped temporary files before it starts storing data to **InnoDB** internal temporary tables on disk. A setting of 0 disables allocation of memory from memory-mapped temporary files. For more information, see [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables).

* **[temptable\_max\_ram](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_temptable_max_ram)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--temptable-max-ram=#** |
| **System Variable** | [**temptable\_max\_ram**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_max_ram) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1073741824** |
| **Minimum Value** | **2097152** |
| **Maximum Value** | **2^64-1** |

* Defines the maximum amount of memory that can be occupied by the **TempTable** storage engine before it starts storing data on disk. The default value is 1073741824 bytes (1GiB). For more information, see [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables).

* **[temptable\_use\_mmap](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_temptable_use_mmap)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--temptable-use-mmap[={OFF|ON}]** |
| **Introduced** | 8.0.16 |
| **Deprecated** | 8.0.26 |
| **System Variable** | [**temptable\_use\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_use_mmap) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* Defines whether the TempTable storage engine allocates space for internal in-memory temporary tables as memory-mapped temporary files when the amount of memory occupied by the TempTable storage engine exceeds the limit defined by the **[temptable\_max\_ram](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_temptable_max_ram)** variable. When **[temptable\_use\_mmap](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_temptable_use_mmap)** is disabled, the TempTable storage engine uses **InnoDB** on-disk internal temporary tables instead. For more information, see [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables).

* **[thread\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_cache_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-cache-size=#** |
| **System Variable** | [**thread\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_cache_size) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **-1** (signifies autosizing; do not assign this literal value) |
| **Minimum Value** | **0** |
| **Maximum Value** | **16384** |

* How many threads the server should cache for reuse. When a client disconnects, the client's threads are put in the cache if there are fewer than **[thread\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_cache_size)** threads there. Requests for threads are satisfied by reusing threads taken from the cache if possible, and only when the cache is empty is a new thread created. This variable can be increased to improve performance if you have a lot of new connections. Normally, this does not provide a notable performance improvement if you have a good thread implementation. However, if your server sees hundreds of connections per second you should normally set **[thread\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_cache_size)** high enough so that most new connections use cached threads. By examining the difference between the [**Connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connections) and **[Threads\_created](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_created)** status variables, you can see how efficient the thread cache is. For details, see [Section 5.1.10, “Server Status Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-status-variables).
* The default value is based on the following formula, capped to a limit of 100:
* 8 + (max\_connections / 100)

* **[thread\_handling](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_handling)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-handling=name** |
| **System Variable** | [**thread\_handling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_handling) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **one-thread-per-connection** |
| **Valid Values** | **no-threads**  **one-thread-per-connection**  **loaded-dynamically** |

* The thread-handling model used by the server for connection threads. The permissible values are **no-threads** (the server uses a single thread to handle one connection), **one-thread-per-connection** (the server uses one thread to handle each client connection), and **loaded-dynamically** (set by the thread pool plugin when it initializes). **no-threads** is useful for debugging under Linux; see [Section 5.9, “Debugging MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#debugging-mysql).

* **[thread\_pool\_algorithm](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_pool_algorithm)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-pool-algorithm=#** |
| **System Variable** | [**thread\_pool\_algorithm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_algorithm) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **1** |

* This variable controls which algorithm the thread pool plugin uses:
  + A value of 0 (the default) uses a conservative low-concurrency algorithm which is most well tested and is known to produce very good results.
  + A value of 1 increases the concurrency and uses a more aggressive algorithm which at times has been known to perform 5–10% better on optimal thread counts, but has degrading performance as the number of connections increases. Its use should be considered as experimental and not supported.

This variable is available only if the thread pool plugin is enabled. See [Section 5.6.3, “MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#thread-pool).

* **[thread\_pool\_high\_priority\_connection](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_pool_high_priority_connection)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-pool-high-priority-connection=#** |
| **System Variable** | [**thread\_pool\_high\_priority\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_high_priority_connection) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **1** |

* This variable affects queuing of new statements prior to execution. If the value is 0 (false, the default), statement queuing uses both the low-priority and high-priority queues. If the value is 1 (true), queued statements always go to the high-priority queue.
* This variable is available only if the thread pool plugin is enabled. See [Section 5.6.3, “MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#thread-pool).

* **[thread\_pool\_max\_active\_query\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_pool_max_active_query_threads)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-pool-max-active-query-threads** |
| **Introduced** | 8.0.19 |
| **System Variable** | [**thread\_pool\_max\_active\_query\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_max_active_query_threads) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **512** |

* The maximum permissible number of active (running) query threads per group. If the value is 0, the thread pool plugin uses up to as many threads as are available.
* This variable is available only if the thread pool plugin is enabled. See [Section 5.6.3, “MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#thread-pool).

* **[thread\_pool\_max\_unused\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_pool_max_unused_threads)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-pool-max-unused-threads=#** |
| **System Variable** | [**thread\_pool\_max\_unused\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_max_unused_threads) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **4096** |

* The maximum permitted number of unused threads in the thread pool. This variable makes it possible to limit the amount of memory used by sleeping threads.
* A value of 0 (the default) means no limit on the number of sleeping threads. A value of ***N*** where ***N*** is greater than 0 means 1 consumer thread and ***N***−1 reserve threads. In this case, if a thread is ready to sleep but the number of sleeping threads is already at the maximum, the thread exits rather than going to sleep.
* A sleeping thread is either sleeping as a consumer thread or a reserve thread. The thread pool permits one thread to be the consumer thread when sleeping. If a thread goes to sleep and there is no existing consumer thread, it sleeps as a consumer thread. When a thread must be woken up, a consumer thread is selected if there is one. A reserve thread is selected only when there is no consumer thread to wake up.
* This variable is available only if the thread pool plugin is enabled. See [Section 5.6.3, “MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#thread-pool).

* **[thread\_pool\_prio\_kickup\_timer](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_pool_prio_kickup_timer)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-pool-prio-kickup-timer=#** |
| **System Variable** | [**thread\_pool\_prio\_kickup\_timer**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_prio_kickup_timer) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **1000** |
| **Minimum Value** | **0** |
| **Maximum Value** | **4294967294** |

* This variable affects statements waiting for execution in the low-priority queue. The value is the number of milliseconds before a waiting statement is moved to the high-priority queue. The default is 1000 (1 second).
* This variable is available only if the thread pool plugin is enabled. See [Section 5.6.3, “MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#thread-pool).

* **[thread\_pool\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_pool_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-pool-size=#** |
| **System Variable** | [**thread\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_size) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **16** |
| **Minimum Value** | **1** |
| **Maximum Value (≥ 8.0.19)** | **512** |
| **Maximum Value (≤ 8.0.18)** | **64** |

* The number of thread groups in the thread pool. This is the most important parameter controlling thread pool performance. It affects how many statements can execute simultaneously. If a value outside the range of permissible values is specified, the thread pool plugin does not load and the server writes a message to the error log.
* This variable is available only if the thread pool plugin is enabled. See [Section 5.6.3, “MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#thread-pool).

* **[thread\_pool\_stall\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_pool_stall_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-pool-stall-limit=#** |
| **System Variable** | [**thread\_pool\_stall\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_stall_limit) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **6** |
| **Minimum Value** | **4** |
| **Maximum Value** | **600** |

* This variable affects executing statements. The value is the amount of time a statement has to finish after starting to execute before it becomes defined as stalled, at which point the thread pool permits the thread group to begin executing another statement. The value is measured in 10 millisecond units, so the default of 6 means 60ms. Short wait values permit threads to start more quickly. Short values are also better for avoiding deadlock situations. Long wait values are useful for workloads that include long-running statements, to avoid starting too many new statements while the current ones execute.
* This variable is available only if the thread pool plugin is enabled. See [Section 5.6.3, “MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#thread-pool).

* **[thread\_stack](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_stack)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--thread-stack=#** |
| **System Variable** | [**thread\_stack**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_stack) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value (64-bit platforms)** | **286720** |
| **Default Value (32-bit platforms)** | **221184** |
| **Minimum Value** | **131072** |
| **Maximum Value (64-bit platforms)** | **18446744073709547520** |
| **Maximum Value (32-bit platforms)** | **4294967295** |
| **Block Size** | **1024** |

* The stack size for each thread. The default is large enough for normal operation. If the thread stack size is too small, it limits the complexity of the SQL statements that the server can handle, the recursion depth of stored procedures, and other memory-consuming actions.

* **[time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_time_zone)**

|  |  |
| --- | --- |
| **System Variable** | [**time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_time_zone) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies (≥ 8.0.17)** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies (≤ 8.0.16)** | No |
| **Type** | String |
| **Default Value** | **SYSTEM** |
| **Minimum Value (≥ 8.0.19)** | **-13:59** |
| **Minimum Value (≤ 8.0.18)** | **-12:59** |
| **Maximum Value (≥ 8.0.19)** | **+14:00** |
| **Maximum Value (≤ 8.0.18)** | **+13:00** |

* The current time zone. This variable is used to initialize the time zone for each client that connects. By default, the initial value of this is **'SYSTEM'** (which means, “use the value of **[system\_time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_system_time_zone)**”). The value can be specified explicitly at server startup with the [--default-time-zone](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_default-time-zone) option. See [Section 5.1.15, “MySQL Server Time Zone Support”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#time-zone-support).
* **Note**
* If set to **SYSTEM**, every MySQL function call that requires a time zone calculation makes a system library call to determine the current system time zone. This call may be protected by a global mutex, resulting in contention.

* **[timestamp](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_timestamp)**

|  |  |
| --- | --- |
| **System Variable** | [**timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_timestamp) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Numeric |
| **Default Value** | **UNIX\_TIMESTAMP()** |
| **Minimum Value** | **1** |
| **Maximum Value** | **2147483647** |

* Set the time for this client. This is used to get the original timestamp if you use the binary log to restore rows. ***timestamp\_value*** should be a Unix epoch timestamp (a value like that returned by [**UNIX\_TIMESTAMP()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_unix-timestamp), not a value in **'*YYYY-MM-DD hh:mm:ss*'** format) or **DEFAULT**.
* Setting [**timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_timestamp) to a constant value causes it to retain that value until it is changed again. Setting [**timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_timestamp) to **DEFAULT** causes its value to be the current date and time as of the time it is accessed.
* [**timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_timestamp) is a **DOUBLE** rather than **BIGINT** because its value includes a microseconds part. The maximum value corresponds to **'2038-01-19 03:14:07'** UTC, the same as for the [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) data type.
* **SET timestamp** affects the value returned by [**NOW()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_now) but not by [**SYSDATE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_sysdate). This means that timestamp settings in the binary log have no effect on invocations of [**SYSDATE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_sysdate). The server can be started with the [--sysdate-is-now](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_sysdate-is-now) option to cause [**SYSDATE()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_sysdate) to be a synonym for [**NOW()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_now), in which case **SET timestamp** affects both functions.

* **[tls\_ciphersuites](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tls_ciphersuites)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--tls-ciphersuites=ciphersuite\_list** |
| **Introduced** | 8.0.16 |
| **System Variable** | [**tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tls_ciphersuites) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **NULL** |

* Which ciphersuites the server permits for encrypted connections that use TLSv1.3. The value is a list of zero or more colon-separated ciphersuite names.
* The ciphersuites that can be named for this variable depend on the SSL library used to compile MySQL. If this variable is not set, its default value is **NULL**, which means that the server permits the default set of ciphersuites. If the variable is set to the empty string, no ciphersuites are enabled and encrypted connections cannot be established. For more information, see [Section 6.3.2, “Encrypted Connection TLS Protocols and Ciphers”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#encrypted-connection-protocols-ciphers).

* **[tls\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tls_version)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--tls-version=protocol\_list** |
| **System Variable** | [**tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tls_version) |
| **Scope** | Global |
| **Dynamic (≥ 8.0.16)** | Yes |
| **Dynamic (≤ 8.0.15)** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value (≥ 8.0.16)** | **TLSv1,TLSv1.1,TLSv1.2,TLSv1.3** (OpenSSL 1.1.1 and higher)  **TLSv1,TLSv1.1,TLSv1.2** (otherwise) |
| **Default Value (≤ 8.0.15)** | **TLSv1,TLSv1.1,TLSv1.2** |

* Which protocols the server permits for encrypted connections. The value is a list of one or more comma-separated protocol names. The protocols that can be named for this variable depend on the SSL library used to compile MySQL. Permitted protocols should be chosen such as not to leave “holes” in the list. For details, see [Section 6.3.2, “Encrypted Connection TLS Protocols and Ciphers”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#encrypted-connection-protocols-ciphers).
* As of MySQL 8.0.16, this variable is dynamic and can be modified at runtime to affect the TSL context the server uses for new connections. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration). Prior to MySQL 8.0.16, this variable can be set only at server startup.
* **Note**
* As of MySQL 8.0.26, the TLSv1 and TLSv1.1 connection protocols are deprecated and support for them is subject to removal in a future version of MySQL. See [Deprecated TLS Protocols](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#encrypted-connection-deprecated-protocols).

* **[tmp\_table\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tmp_table_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--tmp-table-size=#** |
| **System Variable** | [**tmp\_table\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tmp_table_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Integer |
| **Default Value** | **16777216** |
| **Minimum Value** | **1024** |
| **Maximum Value** | **18446744073709551615** |

* The maximum size of internal in-memory temporary tables. This variable does not apply to user-created **MEMORY** tables.
* The actual limit is the smaller of **[tmp\_table\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tmp_table_size)** and **[max\_heap\_table\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_heap_table_size)**. When an in-memory temporary table exceeds the limit, MySQL automatically converts it to an on-disk temporary table.
* Increase the value of **[tmp\_table\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tmp_table_size)** (and **[max\_heap\_table\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_heap_table_size)** if necessary) if you do many advanced **GROUP BY** queries and you have lots of memory.
* You can compare the number of internal on-disk temporary tables created to the total number of internal temporary tables created by comparing **[Created\_tmp\_disk\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_disk_tables)** and **[Created\_tmp\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_tables)** values.
* See also [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables).

* **[tmpdir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tmpdir)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--tmpdir=dir\_name** |
| **System Variable** | [**tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tmpdir) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |

* The path of the directory to use for creating temporary files. It might be useful if your default **/tmp** directory resides on a partition that is too small to hold temporary tables. This variable can be set to a list of several paths that are used in round-robin fashion. Paths should be separated by colon characters (**:**) on Unix and semicolon characters (**;**) on Windows.
* [**tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tmpdir) can be a non-permanent location, such as a directory on a memory-based file system or a directory that is cleared when the server host restarts. If the MySQL server is acting as a replica, and you are using a non-permanent location for **[tmpdir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tmpdir)**, consider setting a different temporary directory for the replica using the **[slave\_load\_tmpdir](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_slave_load_tmpdir)** variable. For a replica, the temporary files used to replicate [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data) statements are stored in this directory, so with a permanent location they can survive machine restarts, although replication can now continue after a restart if the temporary files have been removed.
* For more information about the storage location of temporary files, see [Section B.3.3.5, “Where MySQL Stores Temporary Files”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#temporary-files).

* **[transaction\_alloc\_block\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_alloc_block_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--transaction-alloc-block-size=#** |
| **System Variable** | [**transaction\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_alloc_block_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **8192** |
| **Minimum Value** | **1024** |
| **Maximum Value** | **131072** |
| **Block Size** | **1024** |

* The amount in bytes by which to increase a per-transaction memory pool which needs memory. See the description of **[transaction\_prealloc\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_prealloc_size)**.

* **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--transaction-isolation=name** |
| **System Variable** | [**transaction\_isolation**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_isolation) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Enumeration |
| **Default Value** | **REPEATABLE-READ** |
| **Valid Values** | **READ-UNCOMMITTED**  **READ-COMMITTED**  **REPEATABLE-READ**  **SERIALIZABLE** |

* The transaction isolation level. The default is [**REPEATABLE-READ**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#isolevel_repeatable-read).
* The transaction isolation level has three scopes: global, session, and next transaction. This three-scope implementation leads to some nonstandard isolation-level assignment semantics, as described later.
* To set the global transaction isolation level at startup, use the [--transaction-isolation](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_transaction-isolation) server option.
* At runtime, the isolation level can be set directly using the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement to assign a value to the **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)** system variable, or indirectly using the [**SET TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) statement. If you set **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)** directly to an isolation level name that contains a space, the name should be enclosed within quotation marks, with the space replaced by a dash. For example, use this [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement to set the global value:
* SET GLOBAL transaction\_isolation = 'READ-COMMITTED';
* Setting the global **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)** value sets the isolation level for all subsequent sessions. Existing sessions are unaffected.
* To set the session or next-level **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)** value, use the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement. For most session system variables, these statements are equivalent ways to set the value:
* SET @@SESSION.***var\_name*** = ***value***;
* SET SESSION ***var\_name*** = ***value***;
* SET ***var\_name*** = ***value***;
* SET @@***var\_name*** = ***value***;
* As mentioned previously, the transaction isolation level has a next-transaction scope, in addition to the global and session scopes. To enable the next-transaction scope to be set, [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) syntax for assigning session system variable values has nonstandard semantics for **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)**:
  + To set the session isolation level, use any of these syntaxes:
  + SET @@SESSION.transaction\_isolation = ***value***;
  + SET SESSION transaction\_isolation = ***value***;
  + SET transaction\_isolation = ***value***;

For each of those syntaxes, these semantics apply:

* + - Sets the isolation level for all subsequent transactions performed within the session.
    - Permitted within transactions, but does not affect the current ongoing transaction.
    - If executed between transactions, overrides any preceding statement that sets the next-transaction isolation level.
    - Corresponds to [**SET SESSION TRANSACTION ISOLATION LEVEL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) (with the **SESSION** keyword).
  + To set the next-transaction isolation level, use this syntax:
  + SET @@transaction\_isolation = ***value***;

For that syntax, these semantics apply:

* + - Sets the isolation level only for the next single transaction performed within the session.
    - Subsequent transactions revert to the session isolation level.
    - Not permitted within transactions.
    - Corresponds to [**SET TRANSACTION ISOLATION LEVEL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) (without the **SESSION** keyword).

For more information about [**SET TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) and its relationship to the **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)** system variable, see [Section 13.3.7, “SET TRANSACTION Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction).

* **[transaction\_prealloc\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_prealloc_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--transaction-prealloc-size=#** |
| **System Variable** | [**transaction\_prealloc\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_prealloc_size) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **4096** |
| **Minimum Value** | **1024** |
| **Maximum Value** | **131072** |
| **Block Size** | **1024** |

* There is a per-transaction memory pool from which various transaction-related allocations take memory. The initial size of the pool in bytes is **[transaction\_prealloc\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_prealloc_size)**. For every allocation that cannot be satisfied from the pool because it has insufficient memory available, the pool is increased by **[transaction\_alloc\_block\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_alloc_block_size)** bytes. When the transaction ends, the pool is truncated to **[transaction\_prealloc\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_prealloc_size)** bytes.
* By making **[transaction\_prealloc\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_prealloc_size)** sufficiently large to contain all statements within a single transaction, you can avoid many **malloc()** calls.

* **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--transaction-read-only[={OFF|ON}]** |
| **System Variable** | [**transaction\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_read_only) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* The transaction access mode. The value can be **OFF** (read/write; the default) or **ON** (read only).
* The transaction access mode has three scopes: global, session, and next transaction. This three-scope implementation leads to some nonstandard access-mode assignment semantics, as described later.
* To set the global transaction access mode at startup, use the [--transaction-read-only](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_transaction-read-only) server option.
* At runtime, the access mode can be set directly using the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement to assign a value to the **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)** system variable, or indirectly using the [**SET TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) statement. For example, use this [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement to set the global value:
* SET GLOBAL transaction\_read\_only = ON;
* Setting the global **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)** value sets the access mode for all subsequent sessions. Existing sessions are unaffected.
* To set the session or next-level **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)** value, use the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement. For most session system variables, these statements are equivalent ways to set the value:
* SET @@SESSION.***var\_name*** = ***value***;
* SET SESSION ***var\_name*** = ***value***;
* SET ***var\_name*** = ***value***;
* SET @@***var\_name*** = ***value***;
* As mentioned previously, the transaction access mode has a next-transaction scope, in addition to the global and session scopes. To enable the next-transaction scope to be set, [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) syntax for assigning session system variable values has nonstandard semantics for **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)**,
  + To set the session access mode, use any of these syntaxes:
  + SET @@SESSION.transaction\_read\_only = ***value***;
  + SET SESSION transaction\_read\_only = ***value***;
  + SET transaction\_read\_only = ***value***;

For each of those syntaxes, these semantics apply:

* + - Sets the access mode for all subsequent transactions performed within the session.
    - Permitted within transactions, but does not affect the current ongoing transaction.
    - If executed between transactions, overrides any preceding statement that sets the next-transaction access mode.
    - Corresponds to [**SET SESSION TRANSACTION {READ WRITE | READ ONLY}**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) (with the **SESSION** keyword).
  + To set the next-transaction access mode, use this syntax:
  + SET @@transaction\_read\_only = ***value***;

For that syntax, these semantics apply:

* + - Sets the access mode only for the next single transaction performed within the session.
    - Subsequent transactions revert to the session access mode.
    - Not permitted within transactions.
    - Corresponds to [**SET TRANSACTION {READ WRITE | READ ONLY}**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) (without the **SESSION** keyword).

For more information about [**SET TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) and its relationship to the **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)** system variable, see [Section 13.3.7, “SET TRANSACTION Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction).

* **[unique\_checks](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_unique_checks)**

|  |  |
| --- | --- |
| **System Variable** | [**unique\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_unique_checks) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **ON** |

* If set to 1 (the default), uniqueness checks for secondary indexes in **InnoDB** tables are performed. If set to 0, storage engines are permitted to assume that duplicate keys are not present in input data. If you know for certain that your data does not contain uniqueness violations, you can set this to 0 to speed up large table imports to **InnoDB**.
* Setting this variable to 0 does not require storage engines to ignore duplicate keys. An engine is still permitted to check for them and issue duplicate-key errors if it detects them.

* **[updatable\_views\_with\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_updatable_views_with_limit)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--updatable-views-with-limit[={OFF|ON}]** |
| **System Variable** | [**updatable\_views\_with\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_updatable_views_with_limit) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **1** |

* This variable controls whether updates to a view can be made when the view does not contain all columns of the primary key defined in the underlying table, if the update statement contains a **LIMIT** clause. (Such updates often are generated by GUI tools.) An update is an [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) or [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete) statement. Primary key here means a **PRIMARY KEY**, or a **UNIQUE** index in which no column can contain **NULL**.
* The variable can have two values:
  + **1** or **YES**: Issue a warning only (not an error message). This is the default value.
  + **0** or **NO**: Prohibit the update.

* **[use\_secondary\_engine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_use_secondary_engine)**

|  |  |
| --- | --- |
| **Introduced** | 8.0.13 |
| **System Variable** | [**use\_secondary\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_use_secondary_engine) |
| **Scope** | Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Enumeration |
| **Default Value** | **ON** |
| **Valid Values** | **OFF**  **ON**  **FORCED** |

* For future use.
* Whether to execute queries using a secondary engine.
* For use with HeatWave. See [HeatWave User Guide](https://dev.mysql.com/doc/heatwave/en/" \t "_top).
* **validate\_password.*xxx***

The **validate\_password** component implements a set of system variables having names of the form **validate\_password.*xxx***. These variables affect password testing by that component; see [Section 6.4.3.2, “Password Validation Options and Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#validate-password-options-variables).

* **[version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version)**

The version number for the server. The value might also include a suffix indicating server build or configuration information. -debug indicates that the server was built with debugging support enabled.

* **[version\_comment](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_comment)**

|  |  |
| --- | --- |
| **System Variable** | [**version\_comment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_comment) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The **CMake** configuration program has a [COMPILATION\_COMMENT\_SERVER](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#option_cmake_compilation_comment_server) option that permits a comment to be specified when building MySQL. This variable contains the value of that comment. (Prior to MySQL 8.0.14, **[version\_comment](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_comment)** is set by the [COMPILATION\_COMMENT](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#option_cmake_compilation_comment) option.) See [Section 2.9.7, “MySQL Source-Configuration Options”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#source-configuration-options).

* **[version\_compile\_machine](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_compile_machine)**

|  |  |
| --- | --- |
| **System Variable** | [**version\_compile\_machine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_machine) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The type of the server binary.

* **[version\_compile\_os](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_compile_os)**

|  |  |
| --- | --- |
| **System Variable** | [**version\_compile\_os**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_os) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The type of operating system on which MySQL was built.

* **[version\_compile\_zlib](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_compile_zlib)**

|  |  |
| --- | --- |
| **System Variable** | [**version\_compile\_zlib**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_compile_zlib) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |

* The version of the compiled-in **zlib** library.

* **[wait\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_wait_timeout)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--wait-timeout=#** |
| **System Variable** | [**wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_wait_timeout) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **28800** |
| **Minimum Value** | **1** |
| **Maximum Value (Windows)** | **2147483** |
| **Maximum Value (Other)** | **31536000** |

* The number of seconds the server waits for activity on a noninteractive connection before closing it.
* On thread startup, the session **[wait\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_wait_timeout)** value is initialized from the global **[wait\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_wait_timeout)** value or from the global **[interactive\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_interactive_timeout)** value, depending on the type of client (as defined by the **CLIENT\_INTERACTIVE** connect option to **[mysql\_real\_connect()](https://dev.mysql.com/doc/c-api/8.0/en/mysql-real-connect.html" \t "_top)**). See also **[interactive\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_interactive_timeout)**.

* **[warning\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_warning_count)**

The number of errors, warnings, and notes that resulted from the last statement that generated messages. This variable is read only. See [Section 13.7.7.42, “SHOW WARNINGS Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-warnings).

* **[windowing\_use\_high\_precision](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_windowing_use_high_precision)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--windowing-use-high-precision[={OFF|ON}]** |
| **System Variable** | [**windowing\_use\_high\_precision**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_windowing_use_high_precision) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | Yes |
| **Type** | Boolean |
| **Default Value** | **ON** |

* Whether to compute window operations without loss of precision. See [Section 8.2.1.21, “Window Function Optimization”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#window-function-optimization).

### 5.1.9使用系统变量

[5.1.9.1 System Variable Privileges](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges)

[5.1.9.2 Dynamic System Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#dynamic-system-variables)

[5.1.9.3 Persisted System Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables)

[5.1.9.4 Nonpersistible and Persist-Restricted System Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#nonpersistible-system-variables)

[5.1.9.5 Structured System Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#structured-system-variables)

MySQL服务器维护着许多配置其操作的系统变量。第5.1.8节，"服务器系统变量"，描述了这些变量的含义。每个系统变量都有一个默认值。系统变量可以在服务器启动时使用命令行或选项文件中的选项来设置。大多数系统变量可以在服务器运行时通过SET语句动态改变，这使得你可以修改服务器的操作，而不需要停止和重启它。你也可以在表达式中使用系统变量值。

许多系统变量是内置的。系统变量也可以由服务器插件或组件安装。

- 由服务器插件实现的系统变量在安装该插件时被暴露出来，其名称以插件名称开头。例如，audit\_log插件实现了一个名为audit\_log\_policy的系统变量。

- 由组件实现的系统变量在组件安装时暴露，其名称以组件特定的前缀开始。例如，log\_filter\_dragnet错误日志过滤器组件实现了一个名为log\_error\_filter\_rules的系统变量，它的全名是dragnet.log\_error\_filter\_rules。要引用这个变量，请使用全名。

系统变量的存在有两个范围。全局变量影响服务器的整体运行。会话变量影响其对单个客户端连接的操作。一个给定的系统变量可以同时具有全局和会话值。全局和会话系统变量的关系如下。

- 当服务器启动时，它将每个全局变量初始化为其默认值。这些默认值可以通过在命令行或选项文件中指定的选项来改变。(参见第4.2.2节，"指定程序选项"）。

- 服务器还为每个连接的客户维护一组会话变量。客户端的会话变量在连接时使用相应全局变量的当前值进行初始化。例如，客户端的SQL模式是由会话sql\_mode值控制的，当客户端连接到全局sql\_mode值时，该值被初始化。

对于某些系统变量，会话值不是从相应的全局值初始化的；如果是这样，会在变量描述中指出。

系统变量的值可以在服务器启动时通过在命令行或选项文件中使用选项进行全局设置。在启动时，系统变量的语法与命令选项的语法相同，因此在变量名称中，破折号和下划线可以互换使用。例如，--general\_log=ON和--general-log=ON是等同的。

当你使用启动选项来设置一个取数字值的变量时，该值可以用K、M或G（大写或小写）的后缀来表示1024、10242或10243的乘数；也就是说，分别以千字节、兆字节或千兆字节为单位。从MySQL 8.0.14开始，后缀也可以是T、P和E，表示10244、10245或10246的乘数。因此，下面的命令以InnoDB日志文件大小为16兆字节和最大数据包大小为1吉字节的方式启动服务器。

mysqld --innodb-log-file-size=16M --max-allowed-packet=1G

Within an option file, those variables are set like this:

[mysqld]

innodb\_log\_file\_size=16M

max\_allowed\_packet=1G

The lettercase of suffix letters does not matter; **16M** and **16m** are equivalent, as are **1G** and **1g**.

To restrict the maximum value to which a system variable can be set at runtime with the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement, specify this maximum by using an option of the form --maximum-***var\_name***=***value*** at server startup. For example, to prevent the value of **[innodb\_log\_file\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_log_file_size)** from being increased to more than 32MB at runtime, use the option --maximum-innodb-log-file-size=32M.

Many system variables are dynamic and can be changed at runtime by using the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement. For a list, see [Section 5.1.9.2, “Dynamic System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#dynamic-system-variables). To change a system variable with [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), refer to it by name, optionally preceded by a modifier. At runtime, system variable names must be written using underscores, not dashes. The following examples briefly illustrate this syntax:

* Set a global system variable:
* SET GLOBAL max\_connections = 1000;
* SET @@GLOBAL.max\_connections = 1000;
* Persist a global system variable to the mysqld-auto.cnf file (and set the runtime value):
* SET PERSIST max\_connections = 1000;
* SET @@PERSIST.max\_connections = 1000;
* Persist a global system variable to the mysqld-auto.cnf file (without setting the runtime value):
* SET PERSIST\_ONLY back\_log = 1000;
* SET @@PERSIST\_ONLY.back\_log = 1000;
* Set a session system variable:
* SET SESSION sql\_mode = 'TRADITIONAL';
* SET @@SESSION.sql\_mode = 'TRADITIONAL';
* SET @@sql\_mode = 'TRADITIONAL';

For complete details about [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) syntax, see [Section 13.7.6.1, “SET Syntax for Variable Assignment”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable). For a description of the privilege requirements for setting and persisting system variables, see [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges)

Suffixes for specifying a value multiplier can be used when setting a variable at server startup, but not to set the value with [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) at runtime. On the other hand, with [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) you can assign a variable's value using an expression, which is not true when you set a variable at server startup. For example, the first of the following lines is legal at server startup, but the second is not:

shell> **mysql --max\_allowed\_packet=16M**

shell> **mysql --max\_allowed\_packet=16\*1024\*1024**

Conversely, the second of the following lines is legal at runtime, but the first is not:

mysql> **SET GLOBAL max\_allowed\_packet=16M;**

mysql> **SET GLOBAL max\_allowed\_packet=16\*1024\*1024;**

To display system variable names and values, use the [**SHOW VARIABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-variables) statement:

mysql> **SHOW VARIABLES;**

+---------------------------------+-----------------------------------+

| Variable\_name | Value |

+---------------------------------+-----------------------------------+

| auto\_increment\_increment | 1 |

| auto\_increment\_offset | 1 |

| automatic\_sp\_privileges | ON |

| back\_log | 151 |

| basedir | /home/mysql/ |

| binlog\_cache\_size | 32768 |

| bulk\_insert\_buffer\_size | 8388608 |

| character\_set\_client | utf8 |

| character\_set\_connection | utf8 |

| character\_set\_database | utf8mb4 |

| character\_set\_filesystem | binary |

| character\_set\_results | utf8 |

| character\_set\_server | utf8mb4 |

| character\_set\_system | utf8 |

| character\_sets\_dir | /home/mysql/share/mysql/charsets/ |

| collation\_connection | utf8\_general\_ci |

| collation\_database | utf8mb4\_0900\_ai\_ci |

| collation\_server | utf8mb4\_0900\_ai\_ci |

...

| innodb\_autoextend\_increment | 8 |

| innodb\_buffer\_pool\_size | 8388608 |

| innodb\_commit\_concurrency | 0 |

| innodb\_concurrency\_tickets | 500 |

| innodb\_data\_file\_path | ibdata1:10M:autoextend |

| innodb\_data\_home\_dir | |

...

| version | 8.0.1-dmr-log |

| version\_comment | Source distribution |

| version\_compile\_machine | i686 |

| version\_compile\_os | suse-linux |

| wait\_timeout | 28800 |

+---------------------------------+-----------------------------------+

With a [**LIKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_like) clause, the statement displays only those variables that match the pattern. To obtain a specific variable name, use a [**LIKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_like) clause as shown:

SHOW VARIABLES LIKE 'max\_join\_size';

SHOW SESSION VARIABLES LIKE 'max\_join\_size';

To get a list of variables whose name match a pattern, use the **%** wildcard character in a [**LIKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_like) clause:

SHOW VARIABLES LIKE '%size%';

SHOW GLOBAL VARIABLES LIKE '%size%';

Wildcard characters can be used in any position within the pattern to be matched. Strictly speaking, because **\_** is a wildcard that matches any single character, you should escape it as **\\_** to match it literally. In practice, this is rarely necessary.

For [**SHOW VARIABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-variables), if you specify neither **GLOBAL** nor **SESSION**, MySQL returns **SESSION** values.

The reason for requiring the **GLOBAL** keyword when setting **GLOBAL**-only variables but not when retrieving them is to prevent problems in the future:

* Were a **SESSION** variable to be removed that has the same name as a **GLOBAL** variable, a client with privileges sufficient to modify global variables might accidentally change the **GLOBAL** variable rather than just the **SESSION** variable for its own session.
* Were a **SESSION** variable to be added with the same name as a **GLOBAL** variable, a client that intends to change the **GLOBAL** variable might find only its own **SESSION** variable changed.

#### 5.1.9.1 System Variable Privileges

A system variable can have a global value that affects server operation as a whole, a session value that affects only the current session, or both:

* For dynamic system variables, the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement can be used to change their global or session runtime value (or both), to affect operation of the current server instance. (For information about dynamic variables, see [Section 5.1.9.2, “Dynamic System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#dynamic-system-variables).)
* For certain global system variables, [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) can be used to persist their value to the mysqld-auto.cnf file in the data directory, to affect server operation for subsequent startups. (For information about persisting system variables and the mysqld-auto.cnf file, see [Section 5.1.9.3, “Persisted System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables).)
* For persisted global system variables, [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) can be used to remove their value from mysqld-auto.cnf, to affect server operation for subsequent startups.

This section describes the privileges required for operations that assign values to system variables at runtime. This includes operations that affect runtime values, and operations that persist values.

To set a global system variable, use a [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement with the appropriate keyword. These privileges apply:

* To set a global system variable runtime value, use the [**SET GLOBAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement, which requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege).
* To persist a global system variable to the mysqld-auto.cnf file (and set the runtime value), use the [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement, which requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege.
* To persist a global system variable to the mysqld-auto.cnf file (without setting the runtime value), use the [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement, which requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) and [**PERSIST\_RO\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_persist-ro-variables-admin) privileges. [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) can be used for both dynamic and read-only system variables, but is particularly useful for persisting read-only variables, for which [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) cannot be used.
* Some global system variables are persist-restricted (see [Section 5.1.9.4, “Nonpersistible and Persist-Restricted System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#nonpersistible-system-variables)). To persist these variables, use the [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement, which requires the privileges described previously. In addition, you must connect to the server using an encrypted connection and supply an SSL certificate with the Subject value specified by the [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) system variable.

To remove a persisted global system variable from the mysqld-auto.cnf file, use the [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) statement. These privileges apply:

* For dynamic system variables, [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege.
* For read-only system variables, [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) and [**PERSIST\_RO\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_persist-ro-variables-admin) privileges.
* For persist-restricted variables, [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) does not require an encrypted connection to the server made using a particular SSL certificate.

If a global system variable has any exceptions to the preceding privilege requirements, the variable description indicates those exceptions. Examples include **[default\_table\_encryption](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_default_table_encryption)** and **[mandatory\_roles](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_mandatory_roles)**, which require additional privileges. These additional privileges apply to operations that set the global runtime value, but not operations that persist the value.

To set a session system variable runtime value, use the [**SET SESSION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement. In contrast to setting global runtime values, setting session runtime values normally requires no special privileges and can be done by any user to affect the current session. For some system variables, setting the session value may have effects outside the current session and thus is a restricted operation that can be done only by users who have a special privilege:

* As of MySQL 8.0.14, the privilege required is [**SESSION\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_session-variables-admin).

**Note**

Any user who has [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) effectively has [**SESSION\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_session-variables-admin) by implication and need not be granted [**SESSION\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_session-variables-admin) explicitly.

* Prior to MySQL 8.0.14, the privilege required is [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super).

If a session system variable is restricted, the variable description indicates that restriction. Examples include **[binlog\_format](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_binlog_format)** and **[sql\_log\_bin](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_sql_log_bin)**. Setting the session value of these variables affects binary logging for the current session, but may also have wider implications for the integrity of server replication and backups.

[**SESSION\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_session-variables-admin) enables administrators to minimize the privilege footprint of users who may previously have been granted [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) or [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) for the purpose of enabling them to modify restricted session system variables. Suppose that an administrator has created the following role to confer the ability to set restricted session system variables:

CREATE ROLE set\_session\_sysvars;

GRANT SYSTEM\_VARIABLES\_ADMIN ON \*.\* TO set\_session\_sysvars;

Any user granted the **set\_session\_sysvars** role (and who has that role active) is able to set restricted session system variables. However, that user is also able to set global system variables, which may be undesirable.

By modifying the role to have [**SESSION\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_session-variables-admin) instead of [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin), the role privileges can be reduced to the ability to set restricted session system variables and nothing else. To modify the role, use these statements:

GRANT SESSION\_VARIABLES\_ADMIN ON \*.\* TO set\_session\_sysvars;

REVOKE SYSTEM\_VARIABLES\_ADMIN ON \*.\* FROM set\_session\_sysvars;

Modifying the role has an immediate effect: Any account granted the **set\_session\_sysvars** role no longer has [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) and is not able to set global system variables without being granted that ability explicitly. A similar [**GRANT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#grant)/[**REVOKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#revoke) sequence can be applied to any account that was granted [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) directly rather than by means of a role.

#### 5.1.9.2 Dynamic System Variables

Many server system variables are dynamic and can be set at runtime. See [Section 13.7.6.1, “SET Syntax for Variable Assignment”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable). For a description of the privilege requirements for setting system variables, see [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges)

The following table lists all dynamic system variables applicable within **mysqld**.

The table lists each variable's data type and scope. The last column indicates whether the scope for each variable is Global, Session, or both. Please see the corresponding item descriptions for details on setting and using the variables. Where appropriate, direct links to further information about the items are provided.

Variables that have a type of “string” take a string value. Variables that have a type of “numeric” take a numeric value. Variables that have a type of “boolean” can be set to 0, 1, **ON** or **OFF**. Variables that are marked as “enumeration” normally should be set to one of the available values for the variable, but can also be set to the number that corresponds to the desired enumeration value. For enumerated system variables, the first enumeration value corresponds to 0. This differs from the [**ENUM**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#enum) data type used for table columns, for which the first enumeration value corresponds to 1.

**Table 5.4 Dynamic System Variable Summary**

| **Variable Name** | **Variable Type** | **Variable Scope** |
| --- | --- | --- |
| [**activate\_all\_roles\_on\_login**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_activate_all_roles_on_login) | Boolean | Global |
| [**admin\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_ca) | File name | Global |
| [**admin\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_capath) | Directory name | Global |
| [**admin\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_cert) | File name | Global |
| [**admin\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_cipher) | String | Global |
| [**admin\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_crl) | File name | Global |
| [**admin\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_crlpath) | Directory name | Global |
| [**admin\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_ssl_key) | File name | Global |
| [**admin\_tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_tls_ciphersuites) | String | Global |
| [**admin\_tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_admin_tls_version) | String | Global |
| [**audit\_log\_connection\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_connection_policy) | Enumeration | Global |
| [**audit\_log\_exclude\_accounts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_exclude_accounts) | String | Global |
| [**audit\_log\_flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_flush) | Boolean | Global |
| [**audit\_log\_include\_accounts**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_include_accounts) | String | Global |
| [**audit\_log\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_max_size) | Integer | Global |
| [**audit\_log\_password\_history\_keep\_days**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_password_history_keep_days) | Integer | Global |
| [**audit\_log\_prune\_seconds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_prune_seconds) | Integer | Global |
| [**audit\_log\_read\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_read_buffer_size) | Integer | Varies |
| [**audit\_log\_rotate\_on\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_rotate_on_size) | Integer | Global |
| [**audit\_log\_statement\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_audit_log_statement_policy) | Enumeration | Global |
| [**authentication\_ldap\_sasl\_auth\_method\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_auth_method_name) | String | Global |
| [**authentication\_ldap\_sasl\_bind\_base\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_base_dn) | String | Global |
| [**authentication\_ldap\_sasl\_bind\_root\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_root_dn) | String | Global |
| [**authentication\_ldap\_sasl\_bind\_root\_pwd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_bind_root_pwd) | String | Global |
| [**authentication\_ldap\_sasl\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_ca_path) | String | Global |
| [**authentication\_ldap\_sasl\_group\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_group_search_attr) | String | Global |
| [**authentication\_ldap\_sasl\_group\_search\_filter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_group_search_filter) | String | Global |
| [**authentication\_ldap\_sasl\_init\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_init_pool_size) | Integer | Global |
| [**authentication\_ldap\_sasl\_log\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_log_status) | Integer | Global |
| [**authentication\_ldap\_sasl\_max\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_max_pool_size) | Integer | Global |
| [**authentication\_ldap\_sasl\_referral**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_referral) | Boolean | Global |
| [**authentication\_ldap\_sasl\_server\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_server_host) | String | Global |
| [**authentication\_ldap\_sasl\_server\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_server_port) | Integer | Global |
| [**authentication\_ldap\_sasl\_tls**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_tls) | Boolean | Global |
| [**authentication\_ldap\_sasl\_user\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_sasl_user_search_attr) | String | Global |
| [**authentication\_ldap\_simple\_auth\_method\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_auth_method_name) | String | Global |
| [**authentication\_ldap\_simple\_bind\_base\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_base_dn) | String | Global |
| [**authentication\_ldap\_simple\_bind\_root\_dn**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_root_dn) | String | Global |
| [**authentication\_ldap\_simple\_bind\_root\_pwd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_bind_root_pwd) | String | Global |
| [**authentication\_ldap\_simple\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_ca_path) | String | Global |
| [**authentication\_ldap\_simple\_group\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_group_search_attr) | String | Global |
| [**authentication\_ldap\_simple\_group\_search\_filter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_group_search_filter) | String | Global |
| [**authentication\_ldap\_simple\_init\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_init_pool_size) | Integer | Global |
| [**authentication\_ldap\_simple\_log\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_log_status) | Integer | Global |
| [**authentication\_ldap\_simple\_max\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_max_pool_size) | Integer | Global |
| [**authentication\_ldap\_simple\_referral**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_referral) | Boolean | Global |
| [**authentication\_ldap\_simple\_server\_host**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_server_host) | String | Global |
| [**authentication\_ldap\_simple\_server\_port**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_server_port) | Integer | Global |
| [**authentication\_ldap\_simple\_tls**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_tls) | Boolean | Global |
| [**authentication\_ldap\_simple\_user\_search\_attr**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_authentication_ldap_simple_user_search_attr) | String | Global |
| [**auto\_increment\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_auto_increment_increment) | Integer | Both |
| [**auto\_increment\_offset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_auto_increment_offset) | Integer | Both |
| [**autocommit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_autocommit) | Boolean | Both |
| [**automatic\_sp\_privileges**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_automatic_sp_privileges) | Boolean | Global |
| [**avoid\_temporal\_upgrade**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_avoid_temporal_upgrade) | Boolean | Global |
| [**big\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_big_tables) | Boolean | Both |
| [**binlog\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_cache_size) | Integer | Global |
| [**binlog\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_checksum) | String | Global |
| [**binlog\_direct\_non\_transactional\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_direct_non_transactional_updates) | Boolean | Both |
| [**binlog\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_encryption) | Boolean | Global |
| [**binlog\_error\_action**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_error_action) | Enumeration | Global |
| [**binlog\_expire\_logs\_seconds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_expire_logs_seconds) | Integer | Global |
| [**binlog\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_format) | Enumeration | Both |
| [**binlog\_group\_commit\_sync\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_group_commit_sync_delay) | Integer | Global |
| [**binlog\_group\_commit\_sync\_no\_delay\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_group_commit_sync_no_delay_count) | Integer | Global |
| [**binlog\_max\_flush\_queue\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_max_flush_queue_time) | Integer | Global |
| [**binlog\_order\_commits**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_order_commits) | Boolean | Global |
| [**binlog\_row\_image**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_image) | Enumeration | Both |
| [**binlog\_row\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_metadata) | Enumeration | Global |
| [**binlog\_row\_value\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_row_value_options) | Set | Both |
| [**binlog\_rows\_query\_log\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_rows_query_log_events) | Boolean | Both |
| [**binlog\_stmt\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_stmt_cache_size) | Integer | Global |
| [**binlog\_transaction\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_compression) | Boolean | Both |
| [**binlog\_transaction\_compression\_level\_zstd**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_compression_level_zstd) | Integer | Both |
| [**binlog\_transaction\_dependency\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_dependency_history_size) | Integer | Global |
| [**binlog\_transaction\_dependency\_tracking**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_transaction_dependency_tracking) | Enumeration | Global |
| [**block\_encryption\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_block_encryption_mode) | String | Both |
| [**bulk\_insert\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bulk_insert_buffer_size) | Integer | Both |
| [**character\_set\_client**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_client) | String | Both |
| [**character\_set\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_connection) | String | Both |
| [**character\_set\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_database) | String | Both |
| [**character\_set\_filesystem**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_filesystem) | String | Both |
| [**character\_set\_results**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_results) | String | Both |
| [**character\_set\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_server) | String | Both |
| [**check\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_check_proxy_users) | Boolean | Global |
| [**clone\_autotune\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_autotune_concurrency) | Boolean | Global |
| [**clone\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_buffer_size) | Integer | Global |
| [**clone\_ddl\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ddl_timeout) | Integer | Global |
| [**clone\_donor\_timeout\_after\_network\_failure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_donor_timeout_after_network_failure) | Integer | Global |
| [**clone\_enable\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_enable_compression) | Boolean | Global |
| [**clone\_max\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_concurrency) | Integer | Global |
| [**clone\_max\_data\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_data_bandwidth) | Integer | Global |
| [**clone\_max\_network\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_network_bandwidth) | Integer | Global |
| [**clone\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_ca) | File name | Global |
| [**clone\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_cert) | File name | Global |
| [**clone\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_key) | File name | Global |
| [**clone\_valid\_donor\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_valid_donor_list) | String | Global |
| [**collation\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_connection) | String | Both |
| [**collation\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_database) | String | Both |
| [**collation\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_server) | String | Both |
| [**completion\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_completion_type) | Enumeration | Both |
| [**concurrent\_insert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_concurrent_insert) | Enumeration | Global |
| [**connect\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_connect_timeout) | Integer | Global |
| [**connection\_control\_failed\_connections\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_failed_connections_threshold) | Integer | Global |
| [**connection\_control\_max\_connection\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_max_connection_delay) | Integer | Global |
| [**connection\_control\_min\_connection\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_connection_control_min_connection_delay) | Integer | Global |
| [**cte\_max\_recursion\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_cte_max_recursion_depth) | Integer | Both |
| [**debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug) | String | Both |
| [**debug\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug_sync) | String | Session |
| [**default\_collation\_for\_utf8mb4**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_collation_for_utf8mb4) | Enumeration | Both |
| [**default\_password\_lifetime**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_password_lifetime) | Integer | Global |
| [**default\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_storage_engine) | Enumeration | Both |
| [**default\_table\_encryption**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_table_encryption) | Boolean | Both |
| [**default\_tmp\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_tmp_storage_engine) | Enumeration | Both |
| [**default\_week\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_default_week_format) | Integer | Both |
| [**delay\_key\_write**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delay_key_write) | Enumeration | Global |
| [**delayed\_insert\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_insert_limit) | Integer | Global |
| [**delayed\_insert\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_insert_timeout) | Integer | Global |
| [**delayed\_queue\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_delayed_queue_size) | Integer | Global |
| [**div\_precision\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_div_precision_increment) | Integer | Both |
| [**dragnet.log\_error\_filter\_rules**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_dragnet.log_error_filter_rules) | String | Global |
| [**end\_markers\_in\_json**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_end_markers_in_json) | Boolean | Both |
| [**enforce\_gtid\_consistency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_enforce_gtid_consistency) | Enumeration | Global |
| [**eq\_range\_index\_dive\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_eq_range_index_dive_limit) | Integer | Both |
| [**event\_scheduler**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_event_scheduler) | Enumeration | Global |
| [**expire\_logs\_days**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_expire_logs_days) | Integer | Global |
| [**explicit\_defaults\_for\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_explicit_defaults_for_timestamp) | Boolean | Both |
| [**flush**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush) | Boolean | Global |
| [**flush\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_flush_time) | Integer | Global |
| [**foreign\_key\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_foreign_key_checks) | Boolean | Both |
| [**ft\_boolean\_syntax**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ft_boolean_syntax) | String | Global |
| [**general\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log) | Boolean | Global |
| [**general\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log_file) | File name | Global |
| [**generated\_random\_password\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_generated_random_password_length) | Integer | Both |
| [**group\_concat\_max\_len**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_group_concat_max_len) | Integer | Both |
| [**group\_replication\_advertise\_recovery\_endpoints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_advertise_recovery_endpoints) | String | Global |
| [**group\_replication\_allow\_local\_lower\_version\_join**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_allow_local_lower_version_join) | Boolean | Global |
| [**group\_replication\_auto\_increment\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_auto_increment_increment) | Integer | Global |
| [**group\_replication\_autorejoin\_tries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_autorejoin_tries) | Integer | Global |
| [**group\_replication\_bootstrap\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_bootstrap_group) | Boolean | Global |
| [**group\_replication\_clone\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_clone_threshold) | Integer | Global |
| [**group\_replication\_communication\_debug\_options**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_communication_debug_options) | String | Global |
| [**group\_replication\_communication\_max\_message\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_communication_max_message_size) | Integer | Global |
| [**group\_replication\_components\_stop\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_components_stop_timeout) | Integer | Global |
| [**group\_replication\_compression\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_compression_threshold) | Integer | Global |
| [**group\_replication\_consistency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_consistency) | Enumeration | Both |
| [**group\_replication\_enforce\_update\_everywhere\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_enforce_update_everywhere_checks) | Boolean | Global |
| [**group\_replication\_exit\_state\_action**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_exit_state_action) | Enumeration | Global |
| [**group\_replication\_flow\_control\_applier\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_applier_threshold) | Integer | Global |
| [**group\_replication\_flow\_control\_certifier\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_certifier_threshold) | Integer | Global |
| [**group\_replication\_flow\_control\_hold\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_hold_percent) | Integer | Global |
| [**group\_replication\_flow\_control\_max\_commit\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_max_commit_quota) | Integer | Global |
| [**group\_replication\_flow\_control\_member\_quota\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_member_quota_percent) | Integer | Global |
| [**group\_replication\_flow\_control\_min\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_min_quota) | Integer | Global |
| [**group\_replication\_flow\_control\_min\_recovery\_quota**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_min_recovery_quota) | Integer | Global |
| [**group\_replication\_flow\_control\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_mode) | Enumeration | Global |
| [**group\_replication\_flow\_control\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_period) | Integer | Global |
| [**group\_replication\_flow\_control\_release\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_flow_control_release_percent) | Integer | Global |
| [**group\_replication\_force\_members**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_force_members) | String | Global |
| [**group\_replication\_group\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_group_name) | String | Global |
| [**group\_replication\_group\_seeds**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_group_seeds) | String | Global |
| [**group\_replication\_gtid\_assignment\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_gtid_assignment_block_size) | Integer | Global |
| [**group\_replication\_ip\_allowlist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ip_allowlist) | String | Global |
| [**group\_replication\_ip\_whitelist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ip_whitelist) | String | Global |
| [**group\_replication\_local\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_local_address) | String | Global |
| [**group\_replication\_member\_expel\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_member_expel_timeout) | Integer | Global |
| [**group\_replication\_member\_weight**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_member_weight) | Integer | Global |
| [**group\_replication\_message\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_message_cache_size) | Integer | Global |
| [**group\_replication\_poll\_spin\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_poll_spin_loops) | Integer | Global |
| [**group\_replication\_recovery\_complete\_at**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_complete_at) | Enumeration | Global |
| [**group\_replication\_recovery\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_compression_algorithms) | Set | Global |
| [**group\_replication\_recovery\_get\_public\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_get_public_key) | Boolean | Global |
| [**group\_replication\_recovery\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_public_key_path) | File name | Global |
| [**group\_replication\_recovery\_reconnect\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_reconnect_interval) | Integer | Global |
| [**group\_replication\_recovery\_retry\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_retry_count) | Integer | Global |
| [**group\_replication\_recovery\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_ca) | String | Global |
| [**group\_replication\_recovery\_ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_capath) | String | Global |
| [**group\_replication\_recovery\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_cert) | String | Global |
| [**group\_replication\_recovery\_ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_cipher) | String | Global |
| [**group\_replication\_recovery\_ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_crl) | File name | Global |
| [**group\_replication\_recovery\_ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_crlpath) | Directory name | Global |
| [**group\_replication\_recovery\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_key) | String | Global |
| [**group\_replication\_recovery\_ssl\_verify\_server\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_ssl_verify_server_cert) | Boolean | Global |
| [**group\_replication\_recovery\_tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_tls_ciphersuites) | String | Global |
| [**group\_replication\_recovery\_tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_tls_version) | String | Global |
| [**group\_replication\_recovery\_use\_ssl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_use_ssl) | Boolean | Global |
| [**group\_replication\_recovery\_zstd\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_recovery_zstd_compression_level) | Integer | Global |
| [**group\_replication\_single\_primary\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_single_primary_mode) | Boolean | Global |
| [**group\_replication\_ssl\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_ssl_mode) | Enumeration | Global |
| [**group\_replication\_start\_on\_boot**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_start_on_boot) | Boolean | Global |
| [**group\_replication\_tls\_source**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_tls_source) | Enumeration | Global |
| [**group\_replication\_transaction\_size\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_transaction_size_limit) | Integer | Global |
| [**group\_replication\_unreachable\_majority\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_unreachable_majority_timeout) | Integer | Global |
| [**group\_replication\_view\_change\_uuid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#sysvar_group_replication_view_change_uuid) | String | Global |
| [**gtid\_executed\_compression\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_executed_compression_period) | Integer | Global |
| [**gtid\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_mode) | Enumeration | Global |
| [**gtid\_next**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_next) | Enumeration | Session |
| [**gtid\_purged**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_gtid_purged) | String | Global |
| [**histogram\_generation\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_histogram_generation_max_mem_size) | Integer | Both |
| [**host\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_host_cache_size) | Integer | Global |
| [**identity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_identity) | Integer | Session |
| [**immediate\_server\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_immediate_server_version) | Integer | Session |
| [**information\_schema\_stats\_expiry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_information_schema_stats_expiry) | Integer | Both |
| [**init\_connect**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_init_connect) | String | Global |
| [**init\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_init_slave) | String | Global |
| [**innodb\_adaptive\_flushing**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_flushing) | Boolean | Global |
| [**innodb\_adaptive\_flushing\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_flushing_lwm) | Integer | Global |
| [**innodb\_adaptive\_hash\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_hash_index) | Boolean | Global |
| [**innodb\_adaptive\_max\_sleep\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_adaptive_max_sleep_delay) | Integer | Global |
| [**innodb\_api\_bk\_commit\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_bk_commit_interval) | Integer | Global |
| [**innodb\_api\_trx\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_api_trx_level) | Integer | Global |
| [**innodb\_autoextend\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_autoextend_increment) | Integer | Global |
| [**innodb\_background\_drop\_list\_empty**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_background_drop_list_empty) | Boolean | Global |
| [**innodb\_buffer\_pool\_dump\_at\_shutdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_at_shutdown) | Boolean | Global |
| [**innodb\_buffer\_pool\_dump\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_now) | Boolean | Global |
| [**innodb\_buffer\_pool\_dump\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_dump_pct) | Integer | Global |
| [**innodb\_buffer\_pool\_filename**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_filename) | File name | Global |
| [**innodb\_buffer\_pool\_in\_core\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_in_core_file) | Boolean | Global |
| [**innodb\_buffer\_pool\_load\_abort**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_abort) | Boolean | Global |
| [**innodb\_buffer\_pool\_load\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_now) | Boolean | Global |
| [**innodb\_buffer\_pool\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_size) | Integer | Global |
| [**innodb\_change\_buffer\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffer_max_size) | Integer | Global |
| [**innodb\_change\_buffering**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffering) | Enumeration | Global |
| [**innodb\_change\_buffering\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_change_buffering_debug) | Integer | Global |
| [**innodb\_checkpoint\_disabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_checkpoint_disabled) | Boolean | Global |
| [**innodb\_checksum\_algorithm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_checksum_algorithm) | Enumeration | Global |
| [**innodb\_cmp\_per\_index\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_cmp_per_index_enabled) | Boolean | Global |
| [**innodb\_commit\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_commit_concurrency) | Integer | Global |
| [**innodb\_compress\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compress_debug) | Enumeration | Global |
| [**innodb\_compression\_failure\_threshold\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_failure_threshold_pct) | Integer | Global |
| [**innodb\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_level) | Integer | Global |
| [**innodb\_compression\_pad\_pct\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_compression_pad_pct_max) | Integer | Global |
| [**innodb\_concurrency\_tickets**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_concurrency_tickets) | Integer | Global |
| [**innodb\_ddl\_log\_crash\_reset\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ddl_log_crash_reset_debug) | Boolean | Global |
| [**innodb\_deadlock\_detect**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_deadlock_detect) | Boolean | Global |
| [**innodb\_default\_row\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_default_row_format) | Enumeration | Global |
| [**innodb\_disable\_sort\_file\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_disable_sort_file_cache) | Boolean | Global |
| [**innodb\_extend\_and\_initialize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_extend_and_initialize) | Boolean | Global |
| [**innodb\_fast\_shutdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fast_shutdown) | Integer | Global |
| [**innodb\_fil\_make\_page\_dirty\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fil_make_page_dirty_debug) | Integer | Global |
| [**innodb\_file\_per\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_file_per_table) | Boolean | Global |
| [**innodb\_fill\_factor**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fill_factor) | Integer | Global |
| [**innodb\_flush\_log\_at\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_log_at_timeout) | Integer | Global |
| [**innodb\_flush\_log\_at\_trx\_commit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_log_at_trx_commit) | Enumeration | Global |
| [**innodb\_flush\_neighbors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_neighbors) | Enumeration | Global |
| [**innodb\_flush\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flush_sync) | Boolean | Global |
| [**innodb\_flushing\_avg\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_flushing_avg_loops) | Integer | Global |
| [**innodb\_fsync\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_fsync_threshold) | Integer | Global |
| [**innodb\_ft\_aux\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_aux_table) | String | Global |
| [**innodb\_ft\_enable\_diag\_print**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_enable_diag_print) | Boolean | Global |
| [**innodb\_ft\_enable\_stopword**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_enable_stopword) | Boolean | Both |
| [**innodb\_ft\_num\_word\_optimize**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_num_word_optimize) | Integer | Global |
| [**innodb\_ft\_result\_cache\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_result_cache_limit) | Integer | Global |
| [**innodb\_ft\_server\_stopword\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_server_stopword_table) | String | Global |
| [**innodb\_ft\_user\_stopword\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_ft_user_stopword_table) | String | Both |
| [**innodb\_idle\_flush\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_idle_flush_pct) | Integer | Global |
| [**innodb\_io\_capacity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_io_capacity) | Integer | Global |
| [**innodb\_io\_capacity\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_io_capacity_max) | Integer | Global |
| [**innodb\_limit\_optimistic\_insert\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_limit_optimistic_insert_debug) | Integer | Global |
| [**innodb\_lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_lock_wait_timeout) | Integer | Both |
| [**innodb\_log\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_buffer_size) | Integer | Global |
| [**innodb\_log\_checkpoint\_fuzzy\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checkpoint_fuzzy_now) | Boolean | Global |
| [**innodb\_log\_checkpoint\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checkpoint_now) | Boolean | Global |
| [**innodb\_log\_checksums**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_checksums) | Boolean | Global |
| [**innodb\_log\_compressed\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_compressed_pages) | Boolean | Global |
| [**innodb\_log\_spin\_cpu\_abs\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_spin_cpu_abs_lwm) | Integer | Global |
| [**innodb\_log\_spin\_cpu\_pct\_hwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_spin_cpu_pct_hwm) | Integer | Global |
| [**innodb\_log\_wait\_for\_flush\_spin\_hwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_wait_for_flush_spin_hwm) | Integer | Global |
| [**innodb\_log\_write\_ahead\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_write_ahead_size) | Integer | Global |
| [**innodb\_log\_writer\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_log_writer_threads) | Boolean | Global |
| [**innodb\_lru\_scan\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_lru_scan_depth) | Integer | Global |
| [**innodb\_max\_dirty\_pages\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_dirty_pages_pct) | Numeric | Global |
| [**innodb\_max\_dirty\_pages\_pct\_lwm**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_dirty_pages_pct_lwm) | Numeric | Global |
| [**innodb\_max\_purge\_lag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_purge_lag) | Integer | Global |
| [**innodb\_max\_purge\_lag\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_purge_lag_delay) | Integer | Global |
| [**innodb\_max\_undo\_log\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_max_undo_log_size) | Integer | Global |
| [**innodb\_merge\_threshold\_set\_all\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_merge_threshold_set_all_debug) | Integer | Global |
| [**innodb\_monitor\_disable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_disable) | String | Global |
| [**innodb\_monitor\_enable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_enable) | String | Global |
| [**innodb\_monitor\_reset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_reset) | Enumeration | Global |
| [**innodb\_monitor\_reset\_all**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_monitor_reset_all) | Enumeration | Global |
| [**innodb\_old\_blocks\_pct**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_old_blocks_pct) | Integer | Global |
| [**innodb\_old\_blocks\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_old_blocks_time) | Integer | Global |
| [**innodb\_online\_alter\_log\_max\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_online_alter_log_max_size) | Integer | Global |
| [**innodb\_optimize\_fulltext\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_optimize_fulltext_only) | Boolean | Global |
| [**innodb\_parallel\_read\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_parallel_read_threads) | Integer | Session |
| [**innodb\_print\_all\_deadlocks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_print_all_deadlocks) | Boolean | Global |
| [**innodb\_print\_ddl\_logs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_print_ddl_logs) | Boolean | Global |
| [**innodb\_purge\_batch\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_purge_batch_size) | Integer | Global |
| [**innodb\_purge\_rseg\_truncate\_frequency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_purge_rseg_truncate_frequency) | Integer | Global |
| [**innodb\_random\_read\_ahead**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_random_read_ahead) | Boolean | Global |
| [**innodb\_read\_ahead\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_read_ahead_threshold) | Integer | Global |
| [**innodb\_redo\_log\_archive\_dirs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_redo_log_archive_dirs) | String | Global |
| [**innodb\_redo\_log\_encrypt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_redo_log_encrypt) | Boolean | Global |
| [**innodb\_replication\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_replication_delay) | Integer | Global |
| [**innodb\_rollback\_segments**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_rollback_segments) | Integer | Global |
| [**innodb\_saved\_page\_number\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_saved_page_number_debug) | Integer | Global |
| [**innodb\_segment\_reserve\_factor**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_segment_reserve_factor) | Numeric | Global |
| [**innodb\_spin\_wait\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_spin_wait_delay) | Integer | Global |
| [**innodb\_spin\_wait\_pause\_multiplier**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_spin_wait_pause_multiplier) | Integer | Global |
| [**innodb\_stats\_auto\_recalc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_auto_recalc) | Boolean | Global |
| [**innodb\_stats\_include\_delete\_marked**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_include_delete_marked) | Boolean | Global |
| [**innodb\_stats\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_method) | Enumeration | Global |
| [**innodb\_stats\_on\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_on_metadata) | Boolean | Global |
| [**innodb\_stats\_persistent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_persistent) | Boolean | Global |
| [**innodb\_stats\_persistent\_sample\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_persistent_sample_pages) | Integer | Global |
| [**innodb\_stats\_transient\_sample\_pages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_stats_transient_sample_pages) | Integer | Global |
| [**innodb\_status\_output**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_status_output) | Boolean | Global |
| [**innodb\_status\_output\_locks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_status_output_locks) | Boolean | Global |
| [**innodb\_strict\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_strict_mode) | Boolean | Both |
| [**innodb\_sync\_spin\_loops**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_sync_spin_loops) | Integer | Global |
| [**innodb\_table\_locks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_table_locks) | Boolean | Both |
| [**innodb\_thread\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_thread_concurrency) | Integer | Global |
| [**innodb\_thread\_sleep\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_thread_sleep_delay) | Integer | Global |
| [**innodb\_tmpdir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_tmpdir) | Directory name | Both |
| [**innodb\_trx\_purge\_view\_update\_only\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_trx_purge_view_update_only_debug) | Boolean | Global |
| [**innodb\_trx\_rseg\_n\_slots\_debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_trx_rseg_n_slots_debug) | Integer | Global |
| [**innodb\_undo\_log\_encrypt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_log_encrypt) | Boolean | Global |
| [**innodb\_undo\_log\_truncate**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_log_truncate) | Boolean | Global |
| [**innodb\_undo\_tablespaces**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_undo_tablespaces) | Integer | Global |
| [**innodb\_use\_fdatasync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_use_fdatasync) | Boolean | Global |
| [**insert\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_insert_id) | Integer | Session |
| [**interactive\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_interactive_timeout) | Integer | Both |
| [**internal\_tmp\_disk\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_internal_tmp_disk_storage_engine) | Enumeration | Global |
| [**internal\_tmp\_mem\_storage\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_internal_tmp_mem_storage_engine) | Enumeration | Both |
| [**join\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_join_buffer_size) | Integer | Both |
| [**keep\_files\_on\_create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_keep_files_on_create) | Boolean | Both |
| [**key\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_buffer_size) | Integer | Global |
| [**key\_cache\_age\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_age_threshold) | Integer | Global |
| [**key\_cache\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_block_size) | Integer | Global |
| [**key\_cache\_division\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_division_limit) | Integer | Global |
| [**keyring\_aws\_cmk\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_cmk_id) | String | Global |
| [**keyring\_aws\_region**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_aws_region) | Enumeration | Global |
| [**keyring\_encrypted\_file\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_encrypted_file_data) | File name | Global |
| [**keyring\_encrypted\_file\_password**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_encrypted_file_password) | String | Global |
| [**keyring\_file\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_file_data) | File name | Global |
| [**keyring\_hashicorp\_auth\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_auth_path) | String | Global |
| [**keyring\_hashicorp\_ca\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_ca_path) | File name | Global |
| [**keyring\_hashicorp\_caching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_caching) | Boolean | Global |
| [**keyring\_hashicorp\_role\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_role_id) | String | Global |
| [**keyring\_hashicorp\_secret\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_secret_id) | String | Global |
| [**keyring\_hashicorp\_server\_url**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_server_url) | String | Global |
| [**keyring\_hashicorp\_store\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_hashicorp_store_path) | String | Global |
| [**keyring\_okv\_conf\_dir**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_okv_conf_dir) | Directory name | Global |
| [**keyring\_operations**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_keyring_operations) | Boolean | Global |
| [**last\_insert\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_last_insert_id) | Integer | Session |
| [**lc\_messages**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_messages) | String | Both |
| [**lc\_time\_names**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_time_names) | String | Both |
| [**local\_infile**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_local_infile) | Boolean | Global |
| [**lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_wait_timeout) | Integer | Both |
| [**log\_bin\_trust\_function\_creators**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin_trust_function_creators) | Boolean | Global |
| [**log\_bin\_use\_v1\_row\_events**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_bin_use_v1_row_events) | Boolean | Global |
| [**log\_error\_services**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_services) | String | Global |
| [**log\_error\_suppression\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_suppression_list) | String | Global |
| [**log\_error\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_verbosity) | Integer | Global |
| [**log\_output**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_output) | Set | Global |
| [**log\_queries\_not\_using\_indexes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_queries_not_using_indexes) | Boolean | Global |
| [**log\_raw**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_raw) | Boolean | Global |
| [**log\_slow\_admin\_statements**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_slow_admin_statements) | Boolean | Global |
| [**log\_slow\_extra**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_slow_extra) | Boolean | Global |
| [**log\_slow\_slave\_statements**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_slow_slave_statements) | Boolean | Global |
| [**log\_statements\_unsafe\_for\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_log_statements_unsafe_for_binlog) | Boolean | Global |
| [**log\_syslog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog) | Boolean | Global |
| [**log\_syslog\_facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_facility) | String | Global |
| [**log\_syslog\_include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_include_pid) | Boolean | Global |
| [**log\_syslog\_tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_syslog_tag) | String | Global |
| [**log\_throttle\_queries\_not\_using\_indexes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_throttle_queries_not_using_indexes) | Integer | Global |
| [**log\_timestamps**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_timestamps) | Enumeration | Global |
| [**long\_query\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_long_query_time) | Numeric | Both |
| [**low\_priority\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_low_priority_updates) | Boolean | Both |
| [**mandatory\_roles**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mandatory_roles) | String | Global |
| [**master\_info\_repository**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_master_info_repository) | String | Global |
| [**master\_verify\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_master_verify_checksum) | Boolean | Global |
| [**max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_allowed_packet) | Integer | Both |
| [**max\_binlog\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_cache_size) | Integer | Global |
| [**max\_binlog\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_size) | Integer | Global |
| [**max\_binlog\_stmt\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_binlog_stmt_cache_size) | Integer | Global |
| [**max\_connect\_errors**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_connect_errors) | Integer | Global |
| [**max\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_connections) | Integer | Global |
| [**max\_delayed\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_delayed_threads) | Integer | Both |
| [**max\_error\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_error_count) | Integer | Both |
| [**max\_execution\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_execution_time) | Integer | Both |
| [**max\_heap\_table\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_heap_table_size) | Integer | Both |
| [**max\_insert\_delayed\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_insert_delayed_threads) | Integer | Both |
| [**max\_join\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_join_size) | Integer | Both |
| [**max\_length\_for\_sort\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_length_for_sort_data) | Integer | Both |
| [**max\_points\_in\_geometry**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_points_in_geometry) | Integer | Both |
| [**max\_prepared\_stmt\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_prepared_stmt_count) | Integer | Global |
| [**max\_relay\_log\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_max_relay_log_size) | Integer | Global |
| [**max\_seeks\_for\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_seeks_for_key) | Integer | Both |
| [**max\_sort\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_sort_length) | Integer | Both |
| [**max\_sp\_recursion\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_sp_recursion_depth) | Integer | Both |
| [**max\_user\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_user_connections) | Integer | Both |
| [**max\_write\_lock\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_max_write_lock_count) | Integer | Global |
| [**min\_examined\_row\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_min_examined_row_limit) | Integer | Both |
| [**myisam\_data\_pointer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_data_pointer_size) | Integer | Global |
| [**myisam\_max\_sort\_file\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_max_sort_file_size) | Integer | Global |
| [**myisam\_repair\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_repair_threads) | Integer | Both |
| [**myisam\_sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_sort_buffer_size) | Integer | Both |
| [**myisam\_stats\_method**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_stats_method) | Enumeration | Both |
| [**myisam\_use\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_myisam_use_mmap) | Boolean | Global |
| [**mysql\_firewall\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_mysql_firewall_mode) | Boolean | Global |
| [**mysql\_firewall\_trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_mysql_firewall_trace) | Boolean | Global |
| [**mysql\_native\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_mysql_native_password_proxy_users) | Boolean | Global |
| [**mysqlx\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_compression_algorithms) | Set | Global |
| [**mysqlx\_connect\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_connect_timeout) | Integer | Global |
| [**mysqlx\_deflate\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_deflate_default_compression_level) | Integer | Global |
| [**mysqlx\_deflate\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_deflate_max_client_compression_level) | Integer | Global |
| [**mysqlx\_document\_id\_unique\_prefix**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_document_id_unique_prefix) | Integer | Global |
| [**mysqlx\_enable\_hello\_notice**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_enable_hello_notice) | Boolean | Global |
| [**mysqlx\_idle\_worker\_thread\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_idle_worker_thread_timeout) | Integer | Global |
| [**mysqlx\_interactive\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_interactive_timeout) | Integer | Global |
| [**mysqlx\_lz4\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_lz4_default_compression_level) | Integer | Global |
| [**mysqlx\_lz4\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_lz4_max_client_compression_level) | Integer | Global |
| [**mysqlx\_max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_max_allowed_packet) | Integer | Global |
| [**mysqlx\_max\_connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_max_connections) | Integer | Global |
| [**mysqlx\_min\_worker\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_min_worker_threads) | Integer | Global |
| [**mysqlx\_read\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_read_timeout) | Integer | Session |
| [**mysqlx\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_wait_timeout) | Integer | Session |
| [**mysqlx\_write\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_write_timeout) | Integer | Session |
| [**mysqlx\_zstd\_default\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_zstd_default_compression_level) | Integer | Global |
| [**mysqlx\_zstd\_max\_client\_compression\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#sysvar_mysqlx_zstd_max_client_compression_level) | Integer | Global |
| **ndb\_allow\_copying\_alter\_table** | Boolean | Both |
| [**ndb\_autoincrement\_prefetch\_sz**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_autoincrement_prefetch_sz) | Integer | Both |
| **ndb\_blob\_read\_batch\_bytes** | Integer | Both |
| **ndb\_blob\_write\_batch\_bytes** | Integer | Both |
| [**ndb\_cache\_check\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_cache_check_time) | Integer | Global |
| [**ndb\_clear\_apply\_status**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_clear_apply_status) | Boolean | Global |
| [**ndb\_conflict\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_conflict_role) | Enumeration | Global |
| [**ndb\_data\_node\_neighbour**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_data_node_neighbour) | Integer | Global |
| [**ndb\_dbg\_check\_shares**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_dbg_check_shares) | Integer | Both |
| [**ndb\_default\_column\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_default_column_format) | Enumeration | Global |
| [**ndb\_default\_column\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_default_column_format) | Enumeration | Global |
| [**ndb\_deferred\_constraints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_deferred_constraints) | Integer | Both |
| [**ndb\_deferred\_constraints**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_deferred_constraints) | Integer | Both |
| [**ndb\_distribution**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_distribution) | Enumeration | Global |
| [**ndb\_distribution**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_distribution) | Enumeration | Global |
| [**ndb\_eventbuffer\_free\_percent**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_eventbuffer_free_percent) | Integer | Global |
| [**ndb\_eventbuffer\_max\_alloc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_eventbuffer_max_alloc) | Integer | Global |
| [**ndb\_extra\_logging**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_extra_logging) | Integer | Global |
| [**ndb\_force\_send**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_force_send) | Boolean | Both |
| [**ndb\_fully\_replicated**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_fully_replicated) | Boolean | Both |
| [**ndb\_index\_stat\_enable**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_index_stat_enable) | Boolean | Both |
| [**ndb\_index\_stat\_option**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_index_stat_option) | String | Both |
| [**ndb\_join\_pushdown**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_join_pushdown) | Boolean | Both |
| [**ndb\_log\_binlog\_index**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_binlog_index) | Boolean | Global |
| [**ndb\_log\_empty\_epochs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_empty_epochs) | Boolean | Global |
| [**ndb\_log\_empty\_epochs**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_empty_epochs) | Boolean | Global |
| [**ndb\_log\_empty\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_empty_update) | Boolean | Global |
| [**ndb\_log\_empty\_update**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_empty_update) | Boolean | Global |
| [**ndb\_log\_exclusive\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_exclusive_reads) | Boolean | Both |
| [**ndb\_log\_exclusive\_reads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_log_exclusive_reads) | Boolean | Both |
| **ndb\_log\_update\_as\_write** | Boolean | Global |
| **ndb\_log\_update\_minimal** | Boolean | Global |
| **ndb\_log\_updated\_only** | Boolean | Global |
| [**ndb\_metadata\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_check) | Boolean | Global |
| [**ndb\_metadata\_check\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_check_interval) | Integer | Global |
| [**ndb\_metadata\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_metadata_sync) | Boolean | Global |
| **ndb\_optimization\_delay** | Integer | Global |
| [**ndb\_read\_backup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_read_backup) | Boolean | Global |
| [**ndb\_recv\_thread\_activation\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_recv_thread_activation_threshold) | Integer | Global |
| [**ndb\_recv\_thread\_cpu\_mask**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_recv_thread_cpu_mask) | Bitmap | Global |
| [**ndb\_report\_thresh\_binlog\_epoch\_slip**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_report_thresh_binlog_epoch_slip) | Integer | Global |
| [**ndb\_report\_thresh\_binlog\_mem\_usage**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_report_thresh_binlog_mem_usage) | Integer | Global |
| [**ndb\_row\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_row_checksum) | Integer | Both |
| [**ndb\_schema\_dist\_lock\_wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_schema_dist_lock_wait_timeout) | Integer | Global |
| [**ndb\_show\_foreign\_key\_mock\_tables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_show_foreign_key_mock_tables) | Boolean | Global |
| [**ndb\_slave\_conflict\_role**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_slave_conflict_role) | Enumeration | Global |
| [**ndb\_table\_no\_logging**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_table_no_logging) | Boolean | Session |
| [**ndb\_table\_temporary**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_table_temporary) | Boolean | Session |
| [**ndb\_use\_exact\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_use_exact_count) | Boolean | Both |
| [**ndb\_use\_transactions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndb_use_transactions) | Boolean | Both |
| [**ndbinfo\_max\_bytes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_max_bytes) | Integer | Both |
| [**ndbinfo\_max\_rows**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_max_rows) | Integer | Both |
| [**ndbinfo\_offline**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_offline) | Boolean | Global |
| [**ndbinfo\_show\_hidden**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_ndbinfo_show_hidden) | Boolean | Both |
| [**net\_buffer\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_buffer_length) | Integer | Both |
| [**net\_read\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_read_timeout) | Integer | Both |
| [**net\_retry\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_retry_count) | Integer | Both |
| [**net\_write\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_net_write_timeout) | Integer | Both |
| [**new**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_new) | Boolean | Both |
| [**offline\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_offline_mode) | Boolean | Global |
| [**old\_alter\_table**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_old_alter_table) | Boolean | Both |
| [**optimizer\_prune\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_prune_level) | Integer | Both |
| [**optimizer\_search\_depth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_search_depth) | Integer | Both |
| [**optimizer\_switch**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_switch) | Set | Both |
| [**optimizer\_trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace) | String | Both |
| [**optimizer\_trace\_features**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_features) | String | Both |
| [**optimizer\_trace\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_limit) | Integer | Both |
| [**optimizer\_trace\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_max_mem_size) | Integer | Both |
| [**optimizer\_trace\_offset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_optimizer_trace_offset) | Integer | Both |
| [**original\_commit\_timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_original_commit_timestamp) | Numeric | Session |
| [**original\_server\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_original_server_version) | Integer | Session |
| [**parser\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_parser_max_mem_size) | Integer | Both |
| [**partial\_revokes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_partial_revokes) | Boolean | Global |
| [**password\_history**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_history) | Integer | Global |
| [**password\_require\_current**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_require_current) | Boolean | Global |
| [**password\_reuse\_interval**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_password_reuse_interval) | Integer | Global |
| [**performance\_schema\_max\_digest\_sample\_age**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_max_digest_sample_age) | Integer | Global |
| [**performance\_schema\_show\_processlist**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#sysvar_performance_schema_show_processlist) | Boolean | Global |
| [**preload\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_preload_buffer_size) | Integer | Both |
| [**print\_identified\_with\_as\_hex**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_print_identified_with_as_hex) | Boolean | Both |
| [**profiling**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_profiling) | Boolean | Both |
| [**profiling\_history\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_profiling_history_size) | Integer | Both |
| [**protocol\_compression\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_protocol_compression_algorithms) | Set | Global |
| [**pseudo\_slave\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_slave_mode) | Boolean | Session |
| [**pseudo\_thread\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_thread_id) | Integer | Session |
| [**query\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_query_alloc_block_size) | Integer | Both |
| [**query\_prealloc\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_query_prealloc_size) | Integer | Both |
| [**rand\_seed1**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed1) | Integer | Session |
| [**rand\_seed2**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rand_seed2) | Integer | Session |
| [**range\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_range_alloc_block_size) | Integer | Both |
| [**range\_optimizer\_max\_mem\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_range_optimizer_max_mem_size) | Integer | Both |
| [**rbr\_exec\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rbr_exec_mode) | Enumeration | Both |
| [**read\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_buffer_size) | Integer | Both |
| [**read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_only) | Boolean | Global |
| [**read\_rnd\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_read_rnd_buffer_size) | Integer | Both |
| [**regexp\_stack\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_regexp_stack_limit) | Integer | Global |
| [**regexp\_time\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_regexp_time_limit) | Integer | Global |
| [**relay\_log\_info\_repository**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_info_repository) | String | Global |
| [**relay\_log\_purge**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_purge) | Boolean | Global |
| [**replication\_optimize\_for\_static\_plugin\_config**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_replication_optimize_for_static_plugin_config) | Boolean | Global |
| [**replication\_sender\_observe\_commit\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_replication_sender_observe_commit_only) | Boolean | Global |
| [**require\_row\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_require_row_format) | Boolean | Session |
| [**require\_secure\_transport**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_require_secure_transport) | Boolean | Global |
| [**resultset\_metadata**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_resultset_metadata) | Enumeration | Session |
| [**rewriter\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rewriter_enabled) | Boolean | Global |
| [**rewriter\_verbose**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rewriter_verbose) | Integer | Global |
| [**rpl\_read\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_read_size) | Integer | Global |
| [**rpl\_semi\_sync\_master\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_enabled) | Boolean | Global |
| [**rpl\_semi\_sync\_master\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_timeout) | Integer | Global |
| [**rpl\_semi\_sync\_master\_trace\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_trace_level) | Integer | Global |
| [**rpl\_semi\_sync\_master\_wait\_for\_slave\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_for_slave_count) | Integer | Global |
| [**rpl\_semi\_sync\_master\_wait\_no\_slave**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_no_slave) | Boolean | Global |
| [**rpl\_semi\_sync\_master\_wait\_point**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_master_wait_point) | Enumeration | Global |
| [**rpl\_semi\_sync\_slave\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_slave_enabled) | Boolean | Global |
| [**rpl\_semi\_sync\_slave\_trace\_level**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_semi_sync_slave_trace_level) | Integer | Global |
| [**rpl\_stop\_slave\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_rpl_stop_slave_timeout) | Integer | Global |
| [**schema\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_schema_definition_cache) | Integer | Global |
| [**secondary\_engine\_cost\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_secondary_engine_cost_threshold) | Numeric | Session |
| [**select\_into\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_buffer_size) | Integer | Both |
| [**select\_into\_disk\_sync**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_disk_sync) | Boolean | Both |
| [**select\_into\_disk\_sync\_delay**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_select_into_disk_sync_delay) | Integer | Both |
| [**server\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_server_id) | Integer | Global |
| [**session\_track\_gtids**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_gtids) | Enumeration | Both |
| [**session\_track\_schema**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_schema) | Boolean | Both |
| [**session\_track\_state\_change**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_state_change) | Boolean | Both |
| [**session\_track\_system\_variables**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_system_variables) | String | Both |
| [**session\_track\_transaction\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_session_track_transaction_info) | Enumeration | Both |
| [**sha256\_password\_proxy\_users**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_proxy_users) | Boolean | Global |
| [**show\_create\_table\_skip\_secondary\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_create_table_skip_secondary_engine) | Boolean | Session |
| [**show\_create\_table\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_create_table_verbosity) | Boolean | Both |
| [**show\_old\_temporals**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_show_old_temporals) | Boolean | Both |
| [**slave\_allow\_batching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_slave_allow_batching) | Boolean | Global |
| [**slave\_checkpoint\_group**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_checkpoint_group) | Integer | Global |
| [**slave\_checkpoint\_period**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_checkpoint_period) | Integer | Global |
| [**slave\_compressed\_protocol**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_compressed_protocol) | Boolean | Global |
| [**slave\_exec\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_exec_mode) | Enumeration | Global |
| [**slave\_max\_allowed\_packet**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_max_allowed_packet) | Integer | Global |
| [**slave\_net\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_net_timeout) | Integer | Global |
| [**slave\_parallel\_type**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_parallel_type) | Enumeration | Global |
| [**slave\_parallel\_workers**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_parallel_workers) | Integer | Global |
| [**slave\_pending\_jobs\_size\_max**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_pending_jobs_size_max) | Integer | Global |
| [**slave\_preserve\_commit\_order**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_preserve_commit_order) | Boolean | Global |
| [**slave\_rows\_search\_algorithms**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_rows_search_algorithms) | Set | Global |
| [**slave\_sql\_verify\_checksum**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_sql_verify_checksum) | Boolean | Global |
| [**slave\_transaction\_retries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_transaction_retries) | Integer | Global |
| [**slave\_type\_conversions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_slave_type_conversions) | Set | Global |
| [**slow\_launch\_time**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_launch_time) | Integer | Global |
| [**slow\_query\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log) | Boolean | Global |
| [**slow\_query\_log\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log_file) | File name | Global |
| [**sort\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sort_buffer_size) | Integer | Both |
| [**sql\_auto\_is\_null**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_auto_is_null) | Boolean | Both |
| [**sql\_big\_selects**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_big_selects) | Boolean | Both |
| [**sql\_buffer\_result**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_buffer_result) | Boolean | Both |
| [**sql\_log\_bin**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sql_log_bin) | Boolean | Session |
| [**sql\_log\_off**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_log_off) | Boolean | Both |
| [**sql\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_mode) | Set | Both |
| [**sql\_notes**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_notes) | Boolean | Both |
| [**sql\_quote\_show\_create**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_quote_show_create) | Boolean | Both |
| [**sql\_require\_primary\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_require_primary_key) | Boolean | Both |
| [**sql\_safe\_updates**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_safe_updates) | Boolean | Both |
| [**sql\_select\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_select_limit) | Integer | Both |
| [**sql\_slave\_skip\_counter**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sql_slave_skip_counter) | Integer | Global |
| [**sql\_warnings**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_warnings) | Boolean | Both |
| [**ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_ca) | File name | Global |
| [**ssl\_capath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_capath) | Directory name | Global |
| [**ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_cert) | File name | Global |
| [**ssl\_cipher**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_cipher) | String | Global |
| [**ssl\_crl**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_crl) | File name | Global |
| [**ssl\_crlpath**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_crlpath) | Directory name | Global |
| [**ssl\_fips\_mode**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_fips_mode) | Enumeration | Global |
| [**ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_ssl_key) | File name | Global |
| [**stored\_program\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_stored_program_cache) | Integer | Global |
| [**stored\_program\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_stored_program_definition_cache) | Integer | Global |
| [**super\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_super_read_only) | Boolean | Global |
| [**sync\_binlog**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_binlog) | Integer | Global |
| [**sync\_master\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_master_info) | Integer | Global |
| [**sync\_relay\_log**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_relay_log) | Integer | Global |
| [**sync\_relay\_log\_info**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_sync_relay_log_info) | Integer | Global |
| [**syseventlog.facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.facility) | String | Global |
| [**syseventlog.include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.include_pid) | Boolean | Global |
| [**syseventlog.tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.tag) | String | Global |
| [**table\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_definition_cache) | Integer | Global |
| [**table\_encryption\_privilege\_check**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_encryption_privilege_check) | Boolean | Global |
| [**table\_open\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_table_open_cache) | Integer | Global |
| [**tablespace\_definition\_cache**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tablespace_definition_cache) | Integer | Global |
| [**temptable\_max\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_max_mmap) | Integer | Global |
| [**temptable\_max\_ram**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_max_ram) | Integer | Global |
| [**temptable\_use\_mmap**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_temptable_use_mmap) | Boolean | Global |
| [**thread\_cache\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_cache_size) | Integer | Global |
| [**thread\_pool\_high\_priority\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_high_priority_connection) | Integer | Both |
| [**thread\_pool\_max\_active\_query\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_max_active_query_threads) | Integer | Global |
| [**thread\_pool\_max\_unused\_threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_max_unused_threads) | Integer | Global |
| [**thread\_pool\_prio\_kickup\_timer**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_prio_kickup_timer) | Integer | Global |
| [**thread\_pool\_stall\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_pool_stall_limit) | Integer | Global |
| [**time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_time_zone) | String | Both |
| [**timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_timestamp) | Numeric | Session |
| [**tls\_ciphersuites**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tls_ciphersuites) | String | Global |
| [**tls\_version**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tls_version) | String | Global |
| [**tmp\_table\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_tmp_table_size) | Integer | Both |
| [**transaction\_alloc\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_alloc_block_size) | Integer | Both |
| [**transaction\_allow\_batching**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#sysvar_transaction_allow_batching) | Boolean | Session |
| [**transaction\_isolation**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_isolation) | Enumeration | Both |
| [**transaction\_prealloc\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_prealloc_size) | Integer | Both |
| [**transaction\_read\_only**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_transaction_read_only) | Boolean | Both |
| [**transaction\_write\_set\_extraction**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_transaction_write_set_extraction) | Enumeration | Both |
| [**unique\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_unique_checks) | Boolean | Both |
| [**updatable\_views\_with\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_updatable_views_with_limit) | Boolean | Both |
| [**use\_secondary\_engine**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_use_secondary_engine) | Enumeration | Session |
| [**validate\_password\_check\_user\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_check_user_name) | Boolean | Global |
| [**validate\_password\_dictionary\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_dictionary_file) | File name | Global |
| [**validate\_password\_length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_length) | Integer | Global |
| [**validate\_password\_mixed\_case\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_mixed_case_count) | Integer | Global |
| [**validate\_password\_number\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_number_count) | Integer | Global |
| [**validate\_password\_policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_policy) | Enumeration | Global |
| [**validate\_password\_special\_char\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password_special_char_count) | Integer | Global |
| [**validate\_password.check\_user\_name**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.check_user_name) | Boolean | Global |
| [**validate\_password.dictionary\_file**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.dictionary_file) | File name | Global |
| [**validate\_password.length**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.length) | Integer | Global |
| [**validate\_password.mixed\_case\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.mixed_case_count) | Integer | Global |
| [**validate\_password.number\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.number_count) | Integer | Global |
| [**validate\_password.policy**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.policy) | Enumeration | Global |
| [**validate\_password.special\_char\_count**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sysvar_validate_password.special_char_count) | Integer | Global |
| [**version\_tokens\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_tokens_session) | String | Both |
| [**wait\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_wait_timeout) | Integer | Both |
| [**windowing\_use\_high\_precision**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_windowing_use_high_precision) | Boolean | Both |

#### 5.1.9.3 Persisted System Variables

The MySQL server maintains system variables that configure its operation. A system variable can have a global value that affects server operation as a whole, a session value that affects the current session, or both. Many system variables are dynamic and can be changed at runtime using the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement to affect operation of the current server instance. [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) can also be used to persist certain global system variables to the mysqld-auto.cnf file in the data directory, to affect server operation for subsequent startups. [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) removes persisted settings from mysqld-auto.cnf.

The following discussion describes aspects of persisting system variables:

* [Overview of Persisted System Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables-overview)
* [Syntax for Persisting System Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables-syntax)
* [Obtaining Information About Persisted System Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables-information)
* [Format and Server Handling of the mysqld-auto.cnf File](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#persisted-system-variables-file-handling)

##### Overview of Persisted System Variables

The capability of persisting global system variables at runtime enables server configuration that persists across server startups. Although many system variables can be set at startup from a my.cnf option file, or at runtime using the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement, those methods of configuring the server either require login access to the server host, or do not provide the capability of persistently configuring the server at runtime or remotely:

* Modifying an option file requires direct access to that file, which requires login access to the MySQL server host. This is not always convenient.
* Modifying system variables with [**SET GLOBAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) is a runtime capability that can be done from clients run locally or from remote hosts, but the changes affect only the currently running server instance. The settings are not persistent and do not carry over to subsequent server startups.

To augment administrative capabilities for server configuration beyond what is achievable by editing option files or using [**SET GLOBAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), MySQL provides variants of [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) syntax that persist system variable settings to a file named mysqld-auto.cnf file in the data directory. Examples:

SET PERSIST max\_connections = 1000;

SET @@PERSIST.max\_connections = 1000;

SET PERSIST\_ONLY back\_log = 100;

SET @@PERSIST\_ONLY.back\_log = 100;

MySQL also provides a [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) statement for removing persisted system variables from mysqld-auto.cnf.

Server configuration performed by persisting system variables has these characteristics:

* Persisted settings are made at runtime.
* Persisted settings are permanent. They apply across server restarts.
* Persisted settings can be made from local clients or clients who connect from a remote host. This provides the convenience of remotely configuring multiple MySQL servers from a central client host.
* To persist system variables, you need not have login access to the MySQL server host or file system access to option files. Ability to persist settings is controlled using the MySQL privilege system. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).
* An administrator with sufficient privileges can reconfigure a server by persisting system variables, then cause the server to use the changed settings immediately by executing a [**RESTART**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#restart) statement.
* Persisted settings provide immediate feedback about errors. An error in a manually entered setting might not be discovered until much later. [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statements that persist system variables avoid the possibility of malformed settings because settings with syntax errors do not succeed and do not change server configuration.

##### Syntax for Persisting System Variables

These [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) syntax options are available for persisting system variables:

* To persist a global system variable to the mysqld-auto.cnf option file in the data directory, precede the variable name by the **PERSIST** keyword or the **@@PERSIST.** qualifier:
* SET PERSIST max\_connections = 1000;
* SET @@PERSIST.max\_connections = 1000;

Like [**SET GLOBAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) sets the global variable runtime value, but also writes the variable setting to the mysqld-auto.cnf file (replacing any existing variable setting if there is one).

* To persist a global system variable to the mysqld-auto.cnf file without setting the global variable runtime value, precede the variable name by the **PERSIST\_ONLY** keyword or the **@@PERSIST\_ONLY.** qualifier:
* SET PERSIST\_ONLY back\_log = 1000;
* SET @@PERSIST\_ONLY.back\_log = 1000;

Like **PERSIST**, **PERSIST\_ONLY** writes the variable setting to mysqld-auto.cnf. However, unlike **PERSIST**, **PERSIST\_ONLY** does not modify the global variable runtime value. This makes **PERSIST\_ONLY** suitable for configuring read-only system variables that can be set only at server startup.

For more information about [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), see [Section 13.7.6.1, “SET Syntax for Variable Assignment”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable).

These [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) syntax options are available for removing persisted system variables:

* To remove all persisted variables from mysqld-auto.cnf, use [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) without naming any system variable:
* RESET PERSIST;
* To remove a specific persisted variable from mysqld-auto.cnf, name it in the statement:
* RESET PERSIST ***system\_var\_name***;

This includes plugin system variables, even if the plugin is not currently installed. If the variable is not present in the file, an error occurs.

* To remove a specific persisted variable from mysqld-auto.cnf, but produce a warning rather than an error if the variable is not present in the file, add an **IF EXISTS** clause to the previous syntax:
* RESET PERSIST IF EXISTS ***system\_var\_name***;

For more information about [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist), see [Section 13.7.8.7, “RESET PERSIST Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist).

Using [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) to persist a global system variable to a value of **DEFAULT** or to its literal default value assigns the variable its default value and adds a setting for the variable to mysqld-auto.cnf. To remove the variable from the file, use [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist).

Some system variables cannot be persisted. See [Section 5.1.9.4, “Nonpersistible and Persist-Restricted System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#nonpersistible-system-variables).

A system variable implemented by a plugin can be persisted if the plugin is installed when the [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement is executed. Assignment of the persisted plugin variable takes effect for subsequent server restarts if the plugin is still installed. If the plugin is no longer installed, the plugin variable does not exist when the server reads the mysqld-auto.cnf file. In this case, the server writes a warning to the error log and continues:

currently unknown variable '***var\_name***'

was read from the persisted config file

##### Obtaining Information About Persisted System Variables

The Performance Schema **[persisted\_variables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-persisted-variables-table" \o "27.12.14.1 Performance Schema persisted_variables Table)** table provides an SQL interface to the mysqld-auto.cnf file, enabling its contents to be inspected at runtime using [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements. See [Section 27.12.14.1, “Performance Schema persisted\_variables Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-persisted-variables-table).

The Performance Schema **[variables\_info](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-variables-info-table" \o "27.12.14.2 Performance Schema variables_info Table)** table contains information showing when and by which user each system variable was most recently set. See [Section 27.12.14.2, “Performance Schema variables\_info Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-variables-info-table).

[**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) affects the contents of the **[persisted\_variables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-persisted-variables-table" \o "27.12.14.1 Performance Schema persisted_variables Table)** table because the table contents correspond to the contents of the mysqld-auto.cnf file. On the other hand, because [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) does not change variable values, it has no effect on the contents of the **[variables\_info](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-variables-info-table" \o "27.12.14.2 Performance Schema variables_info Table)** table until the server is restarted.

##### Format and Server Handling of the mysqld-auto.cnf File

The mysqld-auto.cnf file uses a **JSON** format like this (reformatted slightly for readability):

{

"Version": 1,

"mysql\_server": {

"max\_connections": {

"Value": "152",

"Metadata": {

"Timestamp": 1519921341372531,

"User": "root",

"Host": "localhost"

}

},

"transaction\_isolation": {

"Value": "READ-COMMITTED",

"Metadata": {

"Timestamp": 1519921553880520,

"User": "root",

"Host": "localhost"

}

},

"mysql\_server\_static\_options": {

"innodb\_api\_enable\_mdl": {

"Value": "0",

"Metadata": {

"Timestamp": 1519922873467872,

"User": "root",

"Host": "localhost"

}

},

"log\_slave\_updates": {

"Value": "1",

"Metadata": {

"Timestamp": 1519925628441588,

"User": "root",

"Host": "localhost"

}

}

}

}

}

At startup, the server processes the mysqld-auto.cnf file after all other option files (see [Section 4.2.2.2, “Using Option Files”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option-files)). The server handles the file contents as follows:

* If the **[persisted\_globals\_load](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_persisted_globals_load)** system variable is disabled, the server ignores the mysqld-auto.cnf file.
* The **"mysql\_server\_static\_options"** section contains read-only variables persisted using [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable). The section may also (despite its name) contain certain dynamic variables that are not read only. All variables present inside this section are appended to the command line and processed with other command-line options.
* All remaining persisted variables are set by executing the equivalent of a [**SET GLOBAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement later, just before the server starts listening for client connections. These settings therefore do not take effect until late in the startup process, which might be unsuitable for certain system variables. It may be preferable to set such variables in my.cnf rather than in mysqld-auto.cnf.

Management of the mysqld-auto.cnf file should be left to the server. Manipulation of the file should be performed only using [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) and [**RESET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#reset-persist) statements, not manually:

* Removal of the file results in a loss of all persisted settings at the next server startup. (This is permissible if your intent is to reconfigure the server without these settings.) To remove all settings in the file without removing the file itself, use this statement:
* RESET PERSIST;
* Manual changes to the file may result in a parse error at server startup. In this case, the server reports an error and exits. If this issue occurs, start the server with the **[persisted\_globals\_load](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_persisted_globals_load)** system variable disabled or with the [--no-defaults](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_no-defaults) option. Alternatively, remove the mysqld-auto.cnf file. However, as noted previously, removing this file results in a loss of all persisted settings.

#### 5.1.9.4 Nonpersistible and Persist-Restricted System Variables

**[SET PERSIST](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\sql-statements.html" \l "set-variable" \o "13.7.6.1 SET Syntax for Variable Assignment)** and [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) enable global system variables to be persisted to the mysqld-auto.cnf option file in the data directory (see [Section 13.7.6.1, “SET Syntax for Variable Assignment”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable)). However, not all system variables can be persisted, or can be persisted only under certain restrictive conditions. Here are some reasons why a system variable might be nonpersistible or persist-restricted:

* Session system variables cannot be persisted. Session variables cannot be set at server startup, so there is no reason to persist them.
* A global system variable might involve sensitive data such that it should be settable only by a user with direct access to the server host.
* A global system variable might be read only (that is, set only by the server). In this case, it cannot be set by users at all, whether at server startup or at runtime.
* A global system variable might be intended only for internal use.

Nonpersistible system variables cannot be persisted under any circumstances. As of MySQL 8.0.14, persist-restricted system variables can be persisted with [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), but only by users for which the following conditions are satisfied:

* The [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) system variable is set to an SSL certificate X.509 Subject value.
* The user connects to the server using an encrypted connection and supplies an SSL certificate with the designated Subject value.
* The user has sufficient privileges to use [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) (see [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges)).

For example, **[protocol\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_protocol_version)** is read only and set only by the server, so it cannot be persisted under any circumstances. On the other hand, **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** is persist-restricted, so it can be set by users who satisfy the preceding conditions.

The following system variables are nonpersistible. This list may change with ongoing development.

audit\_log\_current\_session

audit\_log\_filter\_id

caching\_sha2\_password\_digest\_rounds

character\_set\_system

core\_file

have\_statement\_timeout

have\_symlink

hostname

innodb\_version

keyring\_hashicorp\_auth\_path

keyring\_hashicorp\_ca\_path

keyring\_hashicorp\_caching

keyring\_hashicorp\_commit\_auth\_path

keyring\_hashicorp\_commit\_ca\_path

keyring\_hashicorp\_commit\_caching

keyring\_hashicorp\_commit\_role\_id

keyring\_hashicorp\_commit\_server\_url

keyring\_hashicorp\_commit\_store\_path

keyring\_hashicorp\_role\_id

keyring\_hashicorp\_secret\_id

keyring\_hashicorp\_server\_url

keyring\_hashicorp\_store\_path

large\_files\_support

large\_page\_size

license

locked\_in\_memory

log\_bin

log\_bin\_basename

log\_bin\_index

lower\_case\_file\_system

ndb\_version

ndb\_version\_string

persist\_only\_admin\_x509\_subject

persisted\_globals\_load

protocol\_version

relay\_log\_basename

relay\_log\_index

server\_uuid

skip\_external\_locking

system\_time\_zone

version\_comment

version\_compile\_machine

version\_compile\_os

version\_compile\_zlib

Persist-restricted system variables are those that are read only and can be set on the command line or in an option file, other than [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) and **[persisted\_globals\_load](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_persisted_globals_load)**. This list may change with ongoing development.

audit\_log\_file

audit\_log\_format

auto\_generate\_certs

basedir

bind\_address

caching\_sha2\_password\_auto\_generate\_rsa\_keys

caching\_sha2\_password\_private\_key\_path

caching\_sha2\_password\_public\_key\_path

character\_sets\_dir

daemon\_memcached\_engine\_lib\_name

daemon\_memcached\_engine\_lib\_path

daemon\_memcached\_option

datadir

default\_authentication\_plugin

ft\_stopword\_file

init\_file

innodb\_buffer\_pool\_load\_at\_startup

innodb\_data\_file\_path

innodb\_data\_home\_dir

innodb\_dedicated\_server

innodb\_directories

innodb\_force\_load\_corrupted

innodb\_log\_group\_home\_dir

innodb\_page\_size

innodb\_read\_only

innodb\_temp\_data\_file\_path

innodb\_temp\_tablespaces\_dir

innodb\_undo\_directory

innodb\_undo\_tablespaces

keyring\_encrypted\_file\_data

keyring\_encrypted\_file\_password

lc\_messages\_dir

log\_error

mecab\_rc\_file

named\_pipe

pid\_file

plugin\_dir

port

relay\_log

relay\_log\_info\_file

secure\_file\_priv

sha256\_password\_auto\_generate\_rsa\_keys

sha256\_password\_private\_key\_path

sha256\_password\_public\_key\_path

shared\_memory

shared\_memory\_base\_name

skip\_networking

slave\_load\_tmpdir

socket

ssl\_ca

ssl\_capath

ssl\_cert

ssl\_crl

ssl\_crlpath

ssl\_key

tmpdir

version\_tokens\_session\_number

To configure the server to enable persisting persist-restricted system variables, use this procedure:

1. Ensure that MySQL is configured to support encrypted connections. See [Section 6.3.1, “Configuring MySQL to Use Encrypted Connections”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections).
2. Designate an SSL certificate X.509 Subject value that signifies the ability to persist persist-restricted system variables, and generate a certificate that has that Subject. See [Section 6.3.3, “Creating SSL and RSA Certificates and Keys”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#creating-ssl-rsa-files).
3. Start the server with [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) set to the designated Subject value. For example, put these lines in your server my.cnf file:
4. [mysqld]
5. persist\_only\_admin\_x509\_subject="***subject-value***"

The format of the Subject value is the same as used for [**CREATE USER ... REQUIRE SUBJECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user). See [Section 13.7.1.3, “CREATE USER Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user).

You must perform this step directly on the MySQL server host because [**persist\_only\_admin\_x509\_subject**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_persist_only_admin_x509_subject) itself cannot be persisted at runtime.

1. Restart the server.
2. Distribute the SSL certificate that has the designated Subject value to users who are to be permitted to persist persist-restricted system variables.

Suppose that myclient-cert.pem is the SSL certificate to be used by clients who can persist persist-restricted system variables. Display the certificate contents using the **openssl** command:

shell> **openssl x509 -text -in myclient-cert.pem**

Certificate:

Data:

Version: 3 (0x2)

Serial Number: 2 (0x2)

Signature Algorithm: md5WithRSAEncryption

Issuer: C=US, ST=IL, L=Chicago, O=MyOrg, OU=CA, CN=MyCN

Validity

Not Before: Oct 18 17:03:03 2018 GMT

Not After : Oct 15 17:03:03 2028 GMT

Subject: C=US, ST=IL, L=Chicago, O=MyOrg, OU=client, CN=MyCN

...

The **openssl** output shows that the certificate Subject value is:

C=US, ST=IL, L=Chicago, O=MyOrg, OU=client, CN=MyCN

To specify the Subject for MySQL, use this format:

/C=US/ST=IL/L=Chicago/O=MyOrg/OU=client/CN=MyCN

Configure the server my.cnf file with the Subject value:

[mysqld]

persist\_only\_admin\_x509\_subject="/C=US/ST=IL/L=Chicago/O=MyOrg/OU=client/CN=MyCN"

Restart the server so that the new configuration takes effect.

Distribute the SSL certificate (and any other associated SSL files) to the appropriate users. Such a user then connects to the server with the certificate and any other SSL options required to establish an encrypted connection.

To use X.509, clients must specify the [--ssl-key](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_ssl-key) and [--ssl-cert](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_ssl-cert) options to connect. It is recommended but not required that [--ssl-ca](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_ssl-ca) also be specified so that the public certificate provided by the server can be verified. For example:

shell> **mysql --ssl-key=myclient-key.pem --ssl-cert=myclient-cert.pem --ssl-ca=mycacert.pem**

Assuming that the user has sufficient privileges to use [**SET PERSIST\_ONLY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), persist-restricted system variables can be persisted like this:

mysql> **SET PERSIST\_ONLY socket = '/tmp/mysql.sock';**

Query OK, 0 rows affected (0.00 sec)

If the server is not configured to enable persisting persist-restricted system variables, or the user does not satisfy the required conditions for that capability, an error occurs:

mysql> **SET PERSIST\_ONLY socket = '/tmp/mysql.sock';**

ERROR 1238 (HY000): Variable 'socket' is a non persistent read only variable

#### 5.1.9.5 Structured System Variables

A structured variable differs from a regular system variable in two respects:

* Its value is a structure with components that specify server parameters considered to be closely related.
* There might be several instances of a given type of structured variable. Each one has a different name and refers to a different resource maintained by the server.

MySQL supports one structured variable type, which specifies parameters governing the operation of key caches. A key cache structured variable has these components:

* [**key\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_buffer_size)
* [**key\_cache\_block\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_block_size)
* [**key\_cache\_division\_limit**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_division_limit)
* [**key\_cache\_age\_threshold**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_key_cache_age_threshold)

This section describes the syntax for referring to structured variables. Key cache variables are used for syntax examples, but specific details about how key caches operate are found elsewhere, in [Section 8.10.2, “The MyISAM Key Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#myisam-key-cache).

To refer to a component of a structured variable instance, you can use a compound name in ***instance\_name.component\_name*** format. Examples:

hot\_cache.key\_buffer\_size

hot\_cache.key\_cache\_block\_size

cold\_cache.key\_cache\_block\_size

For each structured system variable, an instance with the name of **default** is always predefined. If you refer to a component of a structured variable without any instance name, the **default** instance is used. Thus, **default.key\_buffer\_size** and **[key\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_buffer_size)** both refer to the same system variable.

Structured variable instances and components follow these naming rules:

* For a given type of structured variable, each instance must have a name that is unique within variables of that type. However, instance names need not be unique across structured variable types. For example, each structured variable has an instance named **default**, so **default** is not unique across variable types.
* The names of the components of each structured variable type must be unique across all system variable names. If this were not true (that is, if two different types of structured variables could share component member names), it would not be clear which default structured variable to use for references to member names that are not qualified by an instance name.
* If a structured variable instance name is not legal as an unquoted identifier, refer to it as a quoted identifier using backticks. For example, **hot-cache** is not legal, but **`hot-cache`** is.
* **global**, **session**, and **local** are not legal instance names. This avoids a conflict with notation such as **@@GLOBAL.*var\_name*** for referring to nonstructured system variables.

Currently, the first two rules have no possibility of being violated because the only structured variable type is the one for key caches. These rules may assume greater significance if some other type of structured variable is created in the future.

With one exception, you can refer to structured variable components using compound names in any context where simple variable names can occur. For example, you can assign a value to a structured variable using a command-line option:

shell> **mysqld --hot\_cache.key\_buffer\_size=64K**

In an option file, use this syntax:

[mysqld]

hot\_cache.key\_buffer\_size=64K

If you start the server with this option, it creates a key cache named **hot\_cache** with a size of 64KB in addition to the default key cache that has a default size of 8MB.

Suppose that you start the server as follows:

shell> **mysqld --key\_buffer\_size=256K \**

**--extra\_cache.key\_buffer\_size=128K \**

**--extra\_cache.key\_cache\_block\_size=2048**

In this case, the server sets the size of the default key cache to 256KB. (You could also have written --default.key\_buffer\_size=256K.) In addition, the server creates a second key cache named **extra\_cache** that has a size of 128KB, with the size of block buffers for caching table index blocks set to 2048 bytes.

The following example starts the server with three different key caches having sizes in a 3:1:1 ratio:

shell> **mysqld --key\_buffer\_size=6M \**

**--hot\_cache.key\_buffer\_size=2M \**

**--cold\_cache.key\_buffer\_size=2M**

Structured variable values may be set and retrieved at runtime as well. For example, to set a key cache named **hot\_cache** to a size of 10MB, use either of these statements:

mysql> **SET GLOBAL hot\_cache.key\_buffer\_size = 10\*1024\*1024;**

mysql> **SET @@GLOBAL.hot\_cache.key\_buffer\_size = 10\*1024\*1024;**

To retrieve the cache size, do this:

mysql> **SELECT @@GLOBAL.hot\_cache.key\_buffer\_size;**

However, the following statement does not work. The variable is not interpreted as a compound name, but as a simple string for a [**LIKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_like) pattern-matching operation:

mysql> **SHOW GLOBAL VARIABLES LIKE 'hot\_cache.key\_buffer\_size';**

This is the exception to being able to use structured variable names anywhere a simple variable name may occur.

### 5.1.10 服务端系统状态变量

The MySQL server maintains many status variables that provide information about its operation. You can view these variables and their values by using the **SHOW [GLOBAL | SESSION] STATUS** statement (see [Section 13.7.7.37, “SHOW STATUS Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-status)). The optional **GLOBAL** keyword aggregates the values over all connections, and **SESSION** shows the values for the current connection.

mysql> **SHOW GLOBAL STATUS;**

+-----------------------------------+------------+

| Variable\_name | Value |

+-----------------------------------+------------+

| Aborted\_clients | 0 |

| Aborted\_connects | 0 |

| Bytes\_received | 155372598 |

| Bytes\_sent | 1176560426 |

...

| Connections | 30023 |

| Created\_tmp\_disk\_tables | 0 |

| Created\_tmp\_files | 3 |

| Created\_tmp\_tables | 2 |

...

| Threads\_created | 217 |

| Threads\_running | 88 |

| Uptime | 1389872 |

+-----------------------------------+------------+

Many status variables are reset to 0 by the [**FLUSH STATUS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-status) statement.

This section provides a description of each status variable. For a status variable summary, see [Section 5.1.6, “Server Status Variable Reference”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-status-variable-reference). For information about status variables specific to NDB Cluster, see [Section 23.3.3.9.3, “NDB Cluster Status Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html#mysql-cluster-status-variables).

The status variables have the following meanings.

* **[Aborted\_clients](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Aborted_clients)**

The number of connections that were aborted because the client died without closing the connection properly. See [Section B.3.2.9, “Communication Errors and Aborted Connections”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#communication-errors).

* **[Aborted\_connects](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Aborted_connects)**

The number of failed attempts to connect to the MySQL server. See [Section B.3.2.9, “Communication Errors and Aborted Connections”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#communication-errors).

For additional connection-related information, check the **[Connection\_errors\_](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_xxx)*[xxx](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_xxx)*** status variables and the **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table.

* **[Authentication\_ldap\_sasl\_supported\_methods](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Authentication_ldap_sasl_supported_methods)**

The **authentication\_ldap\_sasl** plugin that implements SASL LDAP authentication supports multiple authentication methods, but depending on host system configuration, they might not all be available. The **[Authentication\_ldap\_sasl\_supported\_methods](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Authentication_ldap_sasl_supported_methods)** variable provides discoverability for the supported methods. Its value is a string consisting of supported method names separated by spaces. Example: **"SCRAM-SHA 1 SCRAM-SHA-256 GSSAPI"**

This variable was added in MySQL 8.0.21.

* **[Binlog\_cache\_disk\_use](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Binlog_cache_disk_use)**

The number of transactions that used the temporary binary log cache but that exceeded the value of **[binlog\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_binlog_cache_size)** and used a temporary file to store statements from the transaction.

The number of nontransactional statements that caused the binary log transaction cache to be written to disk is tracked separately in the **[Binlog\_stmt\_cache\_disk\_use](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Binlog_stmt_cache_disk_use)** status variable.

* **[Acl\_cache\_items\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Acl_cache_items_count)**

The number of cached privilege objects. Each object is the privilege combination of a user and its active roles.

* **[Binlog\_cache\_use](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Binlog_cache_use)**

The number of transactions that used the binary log cache.

* **[Binlog\_stmt\_cache\_disk\_use](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Binlog_stmt_cache_disk_use)**

The number of nontransaction statements that used the binary log statement cache but that exceeded the value of **[binlog\_stmt\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_binlog_stmt_cache_size)** and used a temporary file to store those statements.

* **[Binlog\_stmt\_cache\_use](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Binlog_stmt_cache_use)**

The number of nontransactional statements that used the binary log statement cache.

* **[Bytes\_received](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Bytes_received)**

The number of bytes received from all clients.

* **[Bytes\_sent](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Bytes_sent)**

The number of bytes sent to all clients.

* **[Caching\_sha2\_password\_rsa\_public\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Caching_sha2_password_rsa_public_key)**

The public key used by the **caching\_sha2\_password** authentication plugin for RSA key pair-based password exchange. The value is nonempty only if the server successfully initializes the private and public keys in the files named by the [**caching\_sha2\_password\_private\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_private_key_path) and [**caching\_sha2\_password\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_caching_sha2_password_public_key_path) system variables. The value of [**Caching\_sha2\_password\_rsa\_public\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Caching_sha2_password_rsa_public_key) comes from the latter file.

* **Com\_*xxx***

The **Com\_*xxx*** statement counter variables indicate the number of times each ***xxx*** statement has been executed. There is one status variable for each type of statement. For example, **Com\_delete** and **Com\_update** count [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete) and [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) statements, respectively. **Com\_delete\_multi** and **Com\_update\_multi** are similar but apply to [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete) and [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) statements that use multiple-table syntax.

All **Com\_stmt\_*xxx*** variables are increased even if a prepared statement argument is unknown or an error occurred during execution. In other words, their values correspond to the number of requests issued, not to the number of requests successfully completed. For example, because status variables are initialized for each server startup and do not persist across restarts, the **Com\_restart** and **Com\_shutdown** variables that track [**RESTART**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#restart) and [**SHUTDOWN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#shutdown) statements normally have a value of zero, but can be nonzero if [**RESTART**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#restart) or [**SHUTDOWN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#shutdown) statements were executed but failed.

The **Com\_stmt\_*xxx*** status variables are as follows:

* + **Com\_stmt\_prepare**
  + **Com\_stmt\_execute**
  + **Com\_stmt\_fetch**
  + **Com\_stmt\_send\_long\_data**
  + **Com\_stmt\_reset**
  + **Com\_stmt\_close**

Those variables stand for prepared statement commands. Their names refer to the **COM\_*xxx*** command set used in the network layer. In other words, their values increase whenever prepared statement API calls such as **mysql\_stmt\_prepare()**, **mysql\_stmt\_execute()**, and so forth are executed. However, **Com\_stmt\_prepare**, **Com\_stmt\_execute** and **Com\_stmt\_close** also increase for [**PREPARE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#prepare), [**EXECUTE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#execute), or [**DEALLOCATE PREPARE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#deallocate-prepare), respectively. Additionally, the values of the older statement counter variables **Com\_prepare\_sql**, **Com\_execute\_sql**, and **Com\_dealloc\_sql** increase for the [**PREPARE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#prepare), [**EXECUTE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#execute), and [**DEALLOCATE PREPARE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#deallocate-prepare) statements. **Com\_stmt\_fetch** stands for the total number of network round-trips issued when fetching from cursors.

**Com\_stmt\_reprepare** indicates the number of times statements were automatically reprepared by the server, for example, after metadata changes to tables or views referred to by the statement. A reprepare operation increments **Com\_stmt\_reprepare**, and also **Com\_stmt\_prepare**.

**Com\_explain\_other** indicates the number of [**EXPLAIN FOR CONNECTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#explain) statements executed. See [Section 8.8.4, “Obtaining Execution Plan Information for a Named Connection”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#explain-for-connection).

**Com\_change\_repl\_filter** indicates the number of [**CHANGE REPLICATION FILTER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#change-replication-filter) statements executed.

* **[Compression](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Compression)**

Whether the client connection uses compression in the client/server protocol.

As of MySQL 8.0.18, this status variable is deprecated; expect it to be removed in a future version of MySQL. See [Configuring Legacy Connection Compression](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#connection-compression-legacy-configuration).

* **[Compression\_algorithm](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Compression_algorithm)**

The name of the compression algorithm in use for the current connection to the server. The value can be any algorithm permitted in the value of the **[protocol\_compression\_algorithms](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_protocol_compression_algorithms)** system variable. For example, the value is **uncompressed** if the connection does not use compression, or **zlib** if the connection uses the **zlib** algorithm.

For more information, see [Section 4.2.8, “Connection Compression Control”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#connection-compression-control).

This variable was added in MySQL 8.0.18.

* **[Compression\_level](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Compression_level)**

The compression level in use for the current connection to the server. The value is 6 for **zlib** connections (the default **zlib** algorithm compression level), 1 to 22 for **zstd** connections, and 0 for **uncompressed** connections.

For more information, see [Section 4.2.8, “Connection Compression Control”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#connection-compression-control).

This variable was added in MySQL 8.0.18.

* **[Connection\_errors\_](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_xxx)*[xxx](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_xxx)***

These variables provide information about errors that occur during the client connection process. They are global only and represent error counts aggregated across connections from all hosts. These variables track errors not accounted for by the host cache (see [Section 5.1.12.3, “DNS Lookups and the Host Cache”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache)), such as errors that are not associated with TCP connections, occur very early in the connection process (even before an IP address is known), or are not specific to any particular IP address (such as out-of-memory conditions).

* + **[Connection\_errors\_accept](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_accept)**

The number of errors that occurred during calls to **accept()** on the listening port.

* + **[Connection\_errors\_internal](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_internal)**

The number of connections refused due to internal errors in the server, such as failure to start a new thread or an out-of-memory condition.

* + **[Connection\_errors\_max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_max_connections)**

The number of connections refused because the server **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** limit was reached.

* + **[Connection\_errors\_peer\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_peer_address)**

The number of errors that occurred while searching for connecting client IP addresses.

* + **[Connection\_errors\_select](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_select)**

The number of errors that occurred during calls to **select()** or **poll()** on the listening port. (Failure of this operation does not necessarily means a client connection was rejected.)

* + **[Connection\_errors\_tcpwrap](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_tcpwrap)**

The number of connections refused by the **libwrap** library.

* **[Connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connections)**

The number of connection attempts (successful or not) to the MySQL server.

* **[Created\_tmp\_disk\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_disk_tables)**

The number of internal on-disk temporary tables created by the server while executing statements.

You can compare the number of internal on-disk temporary tables created to the total number of internal temporary tables created by comparing **[Created\_tmp\_disk\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_disk_tables)** and **[Created\_tmp\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_tables)** values.

**Note**

Due to a known limitation, **[Created\_tmp\_disk\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_disk_tables)** does not count on-disk temporary tables created in memory-mapped files. By default, the TempTable storage engine overflow mechanism creates internal temporary tables in memory-mapped files. This behavior is controlled by the **[temptable\_use\_mmap](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_temptable_use_mmap)** variable, which is enabled by default.

See also [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables).

* **[Created\_tmp\_files](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_files)**

How many temporary files **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** has created.

* **[Created\_tmp\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_tables)**

The number of internal temporary tables created by the server while executing statements.

You can compare the number of internal on-disk temporary tables created to the total number of internal temporary tables created by comparing **[Created\_tmp\_disk\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_disk_tables)** and **[Created\_tmp\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_tables)** values.

See also [Section 8.4.4, “Internal Temporary Table Use in MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#internal-temporary-tables).

Each invocation of the [**SHOW STATUS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-status) statement uses an internal temporary table and increments the global **[Created\_tmp\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Created_tmp_tables)** value.

* **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**

The active **[ssl\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_ca)** value in the SSL context that the server uses for new connections. This context value may differ from the current **[ssl\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_ca)** system variable value if the system variable has been changed but [**ALTER INSTANCE RELOAD TLS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-instance-reload-tls) has not subsequently been executed to reconfigure the SSL context from the context-related system variable values and update the corresponding status variables. (This potential difference in values applies to each corresponding pair of context-related system and status variables. See [Server-Side Runtime Configuration and Monitoring for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections-server-side-runtime-configuration).)

This variable was added in MySQL 8.0.16.

As of MySQL 8.0.21, the **Current\_tls\_*xxx*** status variable values are also available through the Performance Schema **[tls\_channel\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-tls-channel-status-table" \o "27.12.21.7 The tls_channel_status Table)** table. See [Section 27.12.21.7, “The tls\_channel\_status Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-tls-channel-status-table).

* **[Current\_tls\_capath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_capath)**

The active **[ssl\_capath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_capath)** value in the TSL context that the server uses for new connections. For notes about the relationship between this status variable and its corresponding system variable, see the description of **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**.

This variable was added in MySQL 8.0.16.

* **[Current\_tls\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_cert)**

The active **[ssl\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_cert)** value in the TSL context that the server uses for new connections. For notes about the relationship between this status variable and its corresponding system variable, see the description of **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**.

This variable was added in MySQL 8.0.16.

* **[Current\_tls\_cipher](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_cipher)**

The active **[ssl\_cipher](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_cipher)** value in the TSL context that the server uses for new connections. For notes about the relationship between this status variable and its corresponding system variable, see the description of **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**.

This variable was added in MySQL 8.0.16.

* **[Current\_tls\_ciphersuites](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ciphersuites)**

The active **[tls\_ciphersuites](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tls_ciphersuites)** value in the TSL context that the server uses for new connections. For notes about the relationship between this status variable and its corresponding system variable, see the description of **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**.

This variable was added in MySQL 8.0.16.

* **[Current\_tls\_crl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_crl)**

The active **[ssl\_crl](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_crl)** value in the TSL context that the server uses for new connections. For notes about the relationship between this status variable and its corresponding system variable, see the description of **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**.

This variable was added in MySQL 8.0.16.

* **[Current\_tls\_crlpath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_crlpath)**

The active **[ssl\_crlpath](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_crlpath)** value in the TSL context that the server uses for new connections. For notes about the relationship between this status variable and its corresponding system variable, see the description of **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**.

This variable was added in MySQL 8.0.16.

* **[Current\_tls\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_key)**

The active **[ssl\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_ssl_key)** value in the TSL context that the server uses for new connections. For notes about the relationship between this status variable and its corresponding system variable, see the description of **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**.

This variable was added in MySQL 8.0.16.

* **[Current\_tls\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_version)**

The active **[tls\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_tls_version)** value in the TSL context that the server uses for new connections. For notes about the relationship between this status variable and its corresponding system variable, see the description of **[Current\_tls\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Current_tls_ca)**.

This variable was added in MySQL 8.0.16.

* **[Delayed\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Delayed_errors)**

This status variable is deprecated (because **DELAYED** inserts are not supported); expect it to be removed in a future release.

* **[Delayed\_insert\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Delayed_insert_threads)**

This status variable is deprecated (because **DELAYED** inserts are not supported); expect it to be removed in a future release.

* **[Delayed\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Delayed_writes)**

This status variable is deprecated (because **DELAYED** inserts are not supported); expect it to be removed in a future release.

* **[dragnet.Status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_dragnet.Status)**

The result of the most recent assignment to the **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)** system variable, empty if no such assignment has occurred.

This variable was added in MySQL 8.0.12.

* **[Error\_log\_buffered\_bytes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Error_log_buffered_bytes)**

The number of bytes currently used in the Performance Schema **[error\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-error-log-table" \o "27.12.21.1 The error_log Table)** table. It is possible for the value to decrease, for example, if a new event cannot fit until discarding an old event, but the new event is smaller than the old one.

This variable was added in MySQL 8.0.22.

* **[Error\_log\_buffered\_events](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Error_log_buffered_events)**

The number of events currently present in the Performance Schema **[error\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-error-log-table" \o "27.12.21.1 The error_log Table)** table. As with **[Error\_log\_buffered\_bytes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Error_log_buffered_bytes)**, it is possible for the value to decrease.

This variable was added in MySQL 8.0.22.

* **[Error\_log\_expired\_events](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Error_log_expired_events)**

The number of events discarded from the Performance Schema **[error\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-error-log-table" \o "27.12.21.1 The error_log Table)** table to make room for new events.

This variable was added in MySQL 8.0.22.

* **[Error\_log\_latest\_write](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Error_log_latest_write)**

The time of the last write to the Performance Schema **[error\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-error-log-table" \o "27.12.21.1 The error_log Table)** table.

This variable was added in MySQL 8.0.22.

* **[Flush\_commands](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Flush_commands)**

The number of times the server flushes tables, whether because a user executed a [**FLUSH TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-tables) statement or due to internal server operation. It is also incremented by receipt of a **COM\_REFRESH** packet. This is in contrast to **[Com\_flush](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Com_xxx)**, which indicates how many **FLUSH** statements have been executed, whether [**FLUSH TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-tables), [**FLUSH LOGS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-logs), and so forth.

* **[group\_replication\_primary\_member](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_group_replication_primary_member)**

Shows the primary member's UUID when the group is operating in single-primary mode. If the group is operating in multi-primary mode, shows an empty string.

The **group\_replication\_primary\_member** status variable is deprecated and is scheduled to be removed in a future version.

* **[Handler\_commit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_commit)**

The number of internal [**COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) statements.

* **[Handler\_delete](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_delete)**

The number of times that rows have been deleted from tables.

* **[Handler\_external\_lock](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_external_lock)**

The server increments this variable for each call to its **external\_lock()** function, which generally occurs at the beginning and end of access to a table instance. There might be differences among storage engines. This variable can be used, for example, to discover for a statement that accesses a partitioned table how many partitions were pruned before locking occurred: Check how much the counter increased for the statement, subtract 2 (2 calls for the table itself), then divide by 2 to get the number of partitions locked.

* **[Handler\_mrr\_init](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_mrr_init)**

The number of times the server uses a storage engine's own Multi-Range Read implementation for table access.

* **[Handler\_prepare](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_prepare)**

A counter for the prepare phase of two-phase commit operations.

* **[Handler\_read\_first](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_read_first)**

The number of times the first entry in an index was read. If this value is high, it suggests that the server is doing a lot of full index scans (for example, **SELECT col1 FROM foo**, assuming that **col1** is indexed).

* **[Handler\_read\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_read_key)**

The number of requests to read a row based on a key. If this value is high, it is a good indication that your tables are properly indexed for your queries.

* **[Handler\_read\_last](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_read_last)**

The number of requests to read the last key in an index. With **ORDER BY**, the server issues a first-key request followed by several next-key requests, whereas with **ORDER BY DESC**, the server issues a last-key request followed by several previous-key requests.

* **[Handler\_read\_next](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_read_next)**

The number of requests to read the next row in key order. This value is incremented if you are querying an index column with a range constraint or if you are doing an index scan.

* **[Handler\_read\_prev](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_read_prev)**

The number of requests to read the previous row in key order. This read method is mainly used to optimize **ORDER BY ... DESC**.

* **[Handler\_read\_rnd](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_read_rnd)**

The number of requests to read a row based on a fixed position. This value is high if you are doing a lot of queries that require sorting of the result. You probably have a lot of queries that require MySQL to scan entire tables or you have joins that do not use keys properly.

* **[Handler\_read\_rnd\_next](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_read_rnd_next)**

The number of requests to read the next row in the data file. This value is high if you are doing a lot of table scans. Generally this suggests that your tables are not properly indexed or that your queries are not written to take advantage of the indexes you have.

* **[Handler\_rollback](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_rollback)**

The number of requests for a storage engine to perform a rollback operation.

* **[Handler\_savepoint](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_savepoint)**

The number of requests for a storage engine to place a savepoint.

* **[Handler\_savepoint\_rollback](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_savepoint_rollback)**

The number of requests for a storage engine to roll back to a savepoint.

* **[Handler\_update](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_update)**

The number of requests to update a row in a table.

* **[Handler\_write](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Handler_write)**

The number of requests to insert a row in a table.

* **[Innodb\_buffer\_pool\_dump\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_dump_status)**

The progress of an operation to record the [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) held in the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool), triggered by the setting of **innodb\_buffer\_pool\_dump\_at\_shutdown** or **innodb\_buffer\_pool\_dump\_now**.

For related information and examples, see [Section 15.8.3.6, “Saving and Restoring the Buffer Pool State”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-preload-buffer-pool).

* **[Innodb\_buffer\_pool\_load\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_load_status)**

The progress of an operation to [warm up](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_warm_up) the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool) by reading in a set of [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) corresponding to an earlier point in time, triggered by the setting of [**innodb\_buffer\_pool\_load\_at\_startup**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_at_startup) or [**innodb\_buffer\_pool\_load\_now**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#sysvar_innodb_buffer_pool_load_now). If the operation introduces too much overhead, you can cancel it by setting **[innodb\_buffer\_pool\_load\_abort](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_buffer_pool_load_abort)**.

For related information and examples, see [Section 15.8.3.6, “Saving and Restoring the Buffer Pool State”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-preload-buffer-pool).

* **[Innodb\_buffer\_pool\_bytes\_data](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_bytes_data)**

The total number of bytes in the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool) containing data. The number includes both [dirty](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_dirty_page) and clean pages. For more accurate memory usage calculations than with **[Innodb\_buffer\_pool\_pages\_data](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_data)**, when [compressed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_compression) tables cause the buffer pool to hold pages of different sizes.

* **[Innodb\_buffer\_pool\_pages\_data](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_data)**

The number of [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) in the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool) containing data. The number includes both [dirty](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_dirty_page) and clean pages. When using [compressed tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_compressed_table), the reported **[Innodb\_buffer\_pool\_pages\_data](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_data)** value may be larger than **[Innodb\_buffer\_pool\_pages\_total](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_total)** (Bug #59550).

* **[Innodb\_buffer\_pool\_bytes\_dirty](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_bytes_dirty)**

The total current number of bytes held in [dirty pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_dirty_page) in the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool). For more accurate memory usage calculations than with **[Innodb\_buffer\_pool\_pages\_dirty](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_dirty)**, when [compressed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_compression) tables cause the buffer pool to hold pages of different sizes.

* **[Innodb\_buffer\_pool\_pages\_dirty](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_dirty)**

The current number of [dirty pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_dirty_page) in the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool).

* **[Innodb\_buffer\_pool\_pages\_flushed](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_flushed)**

The number of requests to [flush](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_flush) [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) from the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool).

* **[Innodb\_buffer\_pool\_pages\_free](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_free)**

The number of free [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) in the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool).

* **[Innodb\_buffer\_pool\_pages\_latched](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_latched)**

The number of latched [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) in the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool). These are pages currently being read or written, or that cannot be [flushed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_flush) or removed for some other reason. Calculation of this variable is expensive, so it is available only when the **UNIV\_DEBUG** system is defined at server build time.

* **[Innodb\_buffer\_pool\_pages\_misc](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_misc)**

The number of [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) in the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool) that are busy because they have been allocated for administrative overhead, such as [row locks](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_row_lock) or the [adaptive hash index](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_adaptive_hash_index). This value can also be calculated as [**Innodb\_buffer\_pool\_pages\_total**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_total) − [**Innodb\_buffer\_pool\_pages\_free**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_free) − [**Innodb\_buffer\_pool\_pages\_data**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Innodb_buffer_pool_pages_data). When using [compressed tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_compressed_table), **[Innodb\_buffer\_pool\_pages\_misc](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_misc)** may report an out-of-bounds value (Bug #59550).

* **[Innodb\_buffer\_pool\_pages\_total](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_total)**

The total size of the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool), in [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page). When using [compressed tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_compressed_table), the reported **[Innodb\_buffer\_pool\_pages\_data](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_data)** value may be larger than **[Innodb\_buffer\_pool\_pages\_total](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_pages_total)** (Bug #59550)

* **[Innodb\_buffer\_pool\_read\_ahead](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_read_ahead)**

The number of [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) read into the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool) by the [read-ahead](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_read_ahead) background thread.

* **[Innodb\_buffer\_pool\_read\_ahead\_evicted](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_read_ahead_evicted)**

The number of [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) read into the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool) by the [read-ahead](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_read_ahead) background thread that were subsequently [evicted](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_eviction) without having been accessed by queries.

* **[Innodb\_buffer\_pool\_read\_ahead\_rnd](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_read_ahead_rnd)**

The number of “random” read-aheads initiated by **InnoDB**. This happens when a query scans a large portion of a table but in random order.

* **[Innodb\_buffer\_pool\_read\_requests](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_read_requests)**

The number of logical read requests.

* **[Innodb\_buffer\_pool\_reads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_reads)**

The number of logical reads that **InnoDB** could not satisfy from the [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool), and had to read directly from disk.

* **[Innodb\_buffer\_pool\_resize\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_resize_status)**

The status of an operation to resize the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool) dynamically, triggered by setting the **[innodb\_buffer\_pool\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_buffer_pool_size)** parameter dynamically. The **[innodb\_buffer\_pool\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_buffer_pool_size)** parameter is dynamic, which allows you to resize the buffer pool without restarting the server. See [Configuring InnoDB Buffer Pool Size Online](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-buffer-pool-online-resize) for related information.

* **[Innodb\_buffer\_pool\_wait\_free](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_wait_free)**

Normally, writes to the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool) happen in the background. When **InnoDB** needs to read or create a [page](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) and no clean pages are available, **InnoDB** flushes some [dirty pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_dirty_page) first and waits for that operation to finish. This counter counts instances of these waits. If **[innodb\_buffer\_pool\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_buffer_pool_size)** has been set properly, this value should be small.

* **[Innodb\_buffer\_pool\_write\_requests](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_buffer_pool_write_requests)**

The number of writes done to the **InnoDB** [buffer pool](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_buffer_pool).

* **[Innodb\_data\_fsyncs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_data_fsyncs)**

The number of **fsync()** operations so far. The frequency of **fsync()** calls is influenced by the setting of the **[innodb\_flush\_method](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_flush_method)** configuration option.

* **[Innodb\_data\_pending\_fsyncs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_data_pending_fsyncs)**

The current number of pending **fsync()** operations. The frequency of **fsync()** calls is influenced by the setting of the **[innodb\_flush\_method](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_flush_method)** configuration option.

* **[Innodb\_data\_pending\_reads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_data_pending_reads)**

The current number of pending reads.

* **[Innodb\_data\_pending\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_data_pending_writes)**

The current number of pending writes.

* **[Innodb\_data\_read](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_data_read)**

The amount of data read since the server was started (in bytes).

* **[Innodb\_data\_reads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_data_reads)**

The total number of data reads (OS file reads).

* **[Innodb\_data\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_data_writes)**

The total number of data writes.

* **[Innodb\_data\_written](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_data_written)**

The amount of data written so far, in bytes.

* **[Innodb\_dblwr\_pages\_written](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_dblwr_pages_written)**

The number of [pages](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_page) that have been written to the [doublewrite buffer](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\glossary.html" \l "glos_doublewrite_buffer" \o "doublewrite buffer). See [Section 15.11.1, “InnoDB Disk I/O”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-disk-io).

* **[Innodb\_dblwr\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_dblwr_writes)**

The number of doublewrite operations that have been performed. See [Section 15.11.1, “InnoDB Disk I/O”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-disk-io).

* **[Innodb\_have\_atomic\_builtins](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_have_atomic_builtins)**

Indicates whether the server was built with [atomic instructions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_atomic_instruction).

* **[Innodb\_log\_waits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_log_waits)**

The number of times that the [log buffer](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_log_buffer) was too small and a [wait](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_wait) was required for it to be [flushed](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_flush) before continuing.

* **[Innodb\_log\_write\_requests](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_log_write_requests)**

The number of write requests for the **InnoDB** [redo log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_redo_log).

* **[Innodb\_log\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_log_writes)**

The number of physical writes to the **InnoDB** [redo log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_redo_log) file.

* **[Innodb\_num\_open\_files](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_num_open_files)**

The number of files **InnoDB** currently holds open.

* **[Innodb\_os\_log\_fsyncs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_os_log_fsyncs)**

The number of **fsync()** writes done to the **InnoDB** [redo log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_redo_log) files.

* **[Innodb\_os\_log\_pending\_fsyncs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_os_log_pending_fsyncs)**

The number of pending **fsync()** operations for the **InnoDB** [redo log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_redo_log) files.

* **[Innodb\_os\_log\_pending\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_os_log_pending_writes)**

The number of pending writes to the **InnoDB** [redo log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_redo_log) files.

* **[Innodb\_os\_log\_written](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_os_log_written)**

The number of bytes written to the **InnoDB** [redo log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_redo_log) files.

* **[Innodb\_page\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_page_size)**

**InnoDB** page size (default 16KB). Many values are counted in pages; the page size enables them to be easily converted to bytes.

* **[Innodb\_pages\_created](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_pages_created)**

The number of pages created by operations on **InnoDB** tables.

* **[Innodb\_pages\_read](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_pages_read)**

The number of pages read from the **InnoDB** buffer pool by operations on **InnoDB** tables.

* **[Innodb\_pages\_written](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_pages_written)**

The number of pages written by operations on **InnoDB** tables.

* **[Innodb\_redo\_log\_enabled](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_redo_log_enabled)**

Whether redo logging is enabled or disabled. Introduced in MySQL 8.0.21.

See [Disabling Redo Logging](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-disable-redo-logging).

* **[Innodb\_row\_lock\_current\_waits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_row_lock_current_waits)**

The number of [row locks](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_row_lock) currently being waited for by operations on **InnoDB** tables.

* **[Innodb\_row\_lock\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_row_lock_time)**

The total time spent in acquiring [row locks](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_row_lock) for **InnoDB** tables, in milliseconds.

* **[Innodb\_row\_lock\_time\_avg](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_row_lock_time_avg)**

The average time to acquire a [row lock](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_row_lock) for **InnoDB** tables, in milliseconds.

* **[Innodb\_row\_lock\_time\_max](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_row_lock_time_max)**

The maximum time to acquire a [row lock](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_row_lock) for **InnoDB** tables, in milliseconds.

* **[Innodb\_row\_lock\_waits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_row_lock_waits)**

The number of times operations on **InnoDB** tables had to wait for a [row lock](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\glossary.html#glos_row_lock).

* **[Innodb\_rows\_deleted](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_rows_deleted)**

The number of rows deleted from **InnoDB** tables.

* **[Innodb\_rows\_inserted](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_rows_inserted)**

The number of rows inserted into **InnoDB** tables.

* **[Innodb\_rows\_read](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_rows_read)**

The number of rows read from **InnoDB** tables.

* **[Innodb\_rows\_updated](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_rows_updated)**

The number of rows updated in **InnoDB** tables.

* **[Innodb\_system\_rows\_deleted](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_system_rows_deleted)**

The number of rows deleted from **InnoDB** tables belonging to system-created schemas.

* **[Innodb\_system\_rows\_inserted](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_system_rows_inserted)**

The number of rows inserted into **InnoDB** tables belonging to system-created schemas.

* **[Innodb\_system\_rows\_read](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_system_rows_read)**

The number of rows read from **InnoDB** tables belonging to system-created schemas.

* **[Innodb\_truncated\_status\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_truncated_status_writes)**

The number of times output from the **SHOW ENGINE INNODB STATUS** statement has been truncated.

* **[Innodb\_undo\_tablespaces\_active](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_undo_tablespaces_active)**

The number of active undo tablespaces. Includes both implicit (**InnoDB**-created) and explicit (user-created) undo tablespaces. For information about undo tablespaces, see [Section 15.6.3.4, “Undo Tablespaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-undo-tablespaces).

* **[Innodb\_undo\_tablespaces\_explicit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_undo_tablespaces_explicit)**

The number of user-created undo tablespaces. For information about undo tablespaces, see [Section 15.6.3.4, “Undo Tablespaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-undo-tablespaces).

* **[Innodb\_undo\_tablespaces\_implicit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_undo_tablespaces_implicit)**

The number of undo tablespaces created by **InnoDB**. Two default undo tablespaces are created by **InnoDB** when the MySQL instance is initialized. For information about undo tablespaces, see [Section 15.6.3.4, “Undo Tablespaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-undo-tablespaces).

* **[Innodb\_undo\_tablespaces\_total](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Innodb_undo_tablespaces_total)**

The total number of undo tablespaces. Includes both implicit (**InnoDB**-created) and explicit (user-created) undo tablespaces, active and inactive. For information about undo tablespaces, see [Section 15.6.3.4, “Undo Tablespaces”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#innodb-undo-tablespaces).

* **[Key\_blocks\_not\_flushed](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_blocks_not_flushed)**

The number of key blocks in the **MyISAM** key cache that have changed but have not yet been flushed to disk.

* **[Key\_blocks\_unused](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_blocks_unused)**

The number of unused blocks in the **MyISAM** key cache. You can use this value to determine how much of the key cache is in use; see the discussion of **[key\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_buffer_size)** in [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables).

* **[Key\_blocks\_used](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_blocks_used)**

The number of used blocks in the **MyISAM** key cache. This value is a high-water mark that indicates the maximum number of blocks that have ever been in use at one time.

* **[Key\_read\_requests](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_read_requests)**

The number of requests to read a key block from the **MyISAM** key cache.

* **[Key\_reads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_reads)**

The number of physical reads of a key block from disk into the **MyISAM** key cache. If **[Key\_reads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_reads)** is large, then your **[key\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_key_buffer_size)** value is probably too small. The cache miss rate can be calculated as **[Key\_reads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_reads)**/**[Key\_read\_requests](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_read_requests)**.

* **[Key\_write\_requests](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_write_requests)**

The number of requests to write a key block to the **MyISAM** key cache.

* **[Key\_writes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Key_writes)**

The number of physical writes of a key block from the **MyISAM** key cache to disk.

* **[Last\_query\_cost](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Last_query_cost)**

The total cost of the last compiled query as computed by the query optimizer. This is useful for comparing the cost of different query plans for the same query. The default value of 0 means that no query has been compiled yet. The default value is 0. **[Last\_query\_cost](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Last_query_cost)** has session scope.

In MySQL 8.0.16 and later, this variable shows the cost of queries that have multiple query blocks, summing the cost estimates of each query block, estimating how many times non-cacheable subqueries are executed, and multiplying the cost of those query blocks by the number of subquery executions. (Bug #92766, Bug #28786951) Prior to MySQL 8.0.16, **Last\_query\_cost** was computed accurately only for simple, “flat” queries, but not for complex queries such as those containing subqueries or [**UNION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#union). (For the latter, the value was set to 0.)

* **[Last\_query\_partial\_plans](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Last_query_partial_plans)**

The number of iterations the query optimizer made in execution plan construction for the previous query. **[Last\_query\_cost](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Last_query_cost)** has session scope.

* **[Locked\_connects](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Locked_connects)**

The number of attempts to connect to locked user accounts. For information about account locking and unlocking, see [Section 6.2.19, “Account Locking”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#account-locking).

* **[Max\_execution\_time\_exceeded](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Max_execution_time_exceeded)**

The number of [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements for which the execution timeout was exceeded.

* **[Max\_execution\_time\_set](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Max_execution_time_set)**

The number of [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements for which a nonzero execution timeout was set. This includes statements that include a nonzero [**MAX\_EXECUTION\_TIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-execution-time) optimizer hint, and statements that include no such hint but execute while the timeout indicated by the **[max\_execution\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_execution_time)** system variable is nonzero.

* **[Max\_execution\_time\_set\_failed](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Max_execution_time_set_failed)**

The number of [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements for which the attempt to set an execution timeout failed.

* **[Max\_used\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Max_used_connections)**

The maximum number of connections that have been in use simultaneously since the server started.

* **[Max\_used\_connections\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Max_used_connections_time)**

The time at which **[Max\_used\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Max_used_connections)** reached its current value.

* **[Not\_flushed\_delayed\_rows](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Not_flushed_delayed_rows)**

This status variable is deprecated (because **DELAYED** inserts are not supported); expect it to be removed in a future release.

* **[mecab\_charset](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_mecab_charset)**

The character set currently used by the MeCab full-text parser plugin. For related information, see [Section 12.10.9, “MeCab Full-Text Parser Plugin”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#fulltext-search-mecab).

* **[Ongoing\_anonymous\_transaction\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ongoing_anonymous_transaction_count)**

Shows the number of ongoing transactions which have been marked as anonymous. This can be used to ensure that no further transactions are waiting to be processed.

* **[Ongoing\_anonymous\_gtid\_violating\_transaction\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ongoing_anonymous_gtid_violating_transaction_count)**

This status variable is only available in debug builds. Shows the number of ongoing transactions which use **[gtid\_next=ANONYMOUS](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_gtid_next)** and that violate GTID consistency.

* **[Ongoing\_automatic\_gtid\_violating\_transaction\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ongoing_automatic_gtid_violating_transaction_count)**

This status variable is only available in debug builds. Shows the number of ongoing transactions which use **[gtid\_next=AUTOMATIC](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_gtid_next)** and that violate GTID consistency.

* **[Open\_files](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Open_files)**

The number of files that are open. This count includes regular files opened by the server. It does not include other types of files such as sockets or pipes. Also, the count does not include files that storage engines open using their own internal functions rather than asking the server level to do so.

* **[Open\_streams](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Open_streams)**

The number of streams that are open (used mainly for logging).

* **[Open\_table\_definitions](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Open_table_definitions)**

The number of cached table definitions.

* **[Open\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Open_tables)**

The number of tables that are open.

* **[Opened\_files](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Opened_files)**

The number of files that have been opened with my\_open() (a **mysys** library function). Parts of the server that open files without using this function do not increment the count.

* **[Opened\_table\_definitions](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Opened_table_definitions)**

The number of table definitions that have been cached.

* **[Opened\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Opened_tables)**

The number of tables that have been opened. If **[Opened\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Opened_tables)** is big, your **[table\_open\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache)** value is probably too small.

* **Performance\_schema\_*xxx***

Performance Schema status variables are listed in [Section 27.16, “Performance Schema Status Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-status-variables). These variables provide information about instrumentation that could not be loaded or created due to memory constraints.

* **[Prepared\_stmt\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Prepared_stmt_count)**

The current number of prepared statements. (The maximum number of statements is given by the **[max\_prepared\_stmt\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_prepared_stmt_count)** system variable.)

* **[Queries](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Queries)**

The number of statements executed by the server. This variable includes statements executed within stored programs, unlike the [**Questions**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Questions) variable. It does not count **COM\_PING** or **COM\_STATISTICS** commands.

The discussion at the beginning of this section indicates how to relate this statement-counting status variable to other such variables.

* **[Questions](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Questions)**

The number of statements executed by the server. This includes only statements sent to the server by clients and not statements executed within stored programs, unlike the [**Queries**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Queries) variable. This variable does not count **COM\_PING**, **COM\_STATISTICS**, **COM\_STMT\_PREPARE**, **COM\_STMT\_CLOSE**, or **COM\_STMT\_RESET** commands.

The discussion at the beginning of this section indicates how to relate this statement-counting status variable to other such variables.

* **[Rpl\_semi\_sync\_master\_clients](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_clients)**

The number of semisynchronous replicas.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_net\_avg\_wait\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_net_avg_wait_time)**

The average time in microseconds the source waited for a replica reply. This variable is always **0**, and is deprecated; expect it to be removed in a future version.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_net\_wait\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_net_wait_time)**

The total time in microseconds the source waited for replica replies. This variable is always **0**, and is deprecated; expect it to be removed in a future version.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_net\_waits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_net_waits)**

The total number of times the source waited for replica replies.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_no\_times](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_no_times)**

The number of times the source turned off semisynchronous replication.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_no\_tx](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_no_tx)**

The number of commits that were not acknowledged successfully by a replica.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_status)**

Whether semisynchronous replication currently is operational on the source. The value is **ON** if the plugin has been enabled and a commit acknowledgment has occurred. It is **OFF** if the plugin is not enabled or the source has fallen back to asynchronous replication due to commit acknowledgment timeout.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_timefunc\_failures](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_timefunc_failures)**

The number of times the source failed when calling time functions such as **gettimeofday()**.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_tx\_avg\_wait\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_tx_avg_wait_time)**

The average time in microseconds the source waited for each transaction.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_tx\_wait\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_tx_wait_time)**

The total time in microseconds the source waited for transactions.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_tx\_waits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_tx_waits)**

The total number of times the source waited for transactions.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_wait\_pos\_backtraverse](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_wait_pos_backtraverse)**

The total number of times the source waited for an event with binary coordinates lower than events waited for previously. This can occur when the order in which transactions start waiting for a reply is different from the order in which their binary log events are written.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_wait\_sessions](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_wait_sessions)**

The number of sessions currently waiting for replica replies.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_master\_yes\_tx](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_master_yes_tx)**

The number of commits that were acknowledged successfully by a replica.

This variable is available only if the source-side semisynchronous replication plugin is installed.

* **[Rpl\_semi\_sync\_slave\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rpl_semi_sync_slave_status)**

Whether semisynchronous replication currently is operational on the replica. This is **ON** if the plugin has been enabled and the replication I/O thread is running, **OFF** otherwise.

This variable is available only if the replica-side semisynchronous replication plugin is installed.

* **[Rsa\_public\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rsa_public_key)**

The value of this variable is the public key used by the **sha256\_password** authentication plugin for RSA key pair-based password exchange. The value is nonempty only if the server successfully initializes the private and public keys in the files named by the [**sha256\_password\_private\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_private_key_path) and [**sha256\_password\_public\_key\_path**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sha256_password_public_key_path) system variables. The value of **[Rsa\_public\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rsa_public_key)** comes from the latter file.

For information about **sha256\_password**, see [Section 6.4.1.3, “SHA-256 Pluggable Authentication”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#sha256-pluggable-authentication).

* **[Secondary\_engine\_execution\_count](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Secondary_engine_execution_count)**

The number of queries offloaded to a secondary engine. This variable was added in MySQL 8.0.13.

For use with HeatWave. See [HeatWave User Guide](https://dev.mysql.com/doc/heatwave/en/" \t "_top).

* **[Select\_full\_join](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Select_full_join)**

The number of joins that perform table scans because they do not use indexes. If this value is not 0, you should carefully check the indexes of your tables.

* **[Select\_full\_range\_join](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Select_full_range_join)**

The number of joins that used a range search on a reference table.

* **[Select\_range](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Select_range)**

The number of joins that used ranges on the first table. This is normally not a critical issue even if the value is quite large.

* **[Select\_range\_check](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Select_range_check)**

The number of joins without keys that check for key usage after each row. If this is not 0, you should carefully check the indexes of your tables.

* **[Select\_scan](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Select_scan)**

The number of joins that did a full scan of the first table.

* **[Slave\_open\_temp\_tables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Slave_open_temp_tables)**

The number of temporary tables that the replication SQL thread currently has open. If the value is greater than zero, it is not safe to shut down the replica; see [Section 17.5.1.31, “Replication and Temporary Tables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-features-temptables). This variable reports the total count of open temporary tables for all replication channels.

* **[Slave\_rows\_last\_search\_algorithm\_used](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Slave_rows_last_search_algorithm_used)**

The search algorithm that was most recently used by this replica to locate rows for row-based replication. The result shows whether the replica used indexes, a table scan, or hashing as the search algorithm for the last transaction executed on any channel.

The method used depends on the setting for the **[slave\_rows\_search\_algorithms](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_slave_rows_search_algorithms)** system variable, and the keys that are available on the relevant table.

This variable is available only for debug builds of MySQL.

* **[Slow\_launch\_threads](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Slow_launch_threads)**

The number of threads that have taken more than **[slow\_launch\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_launch_time)** seconds to create.

* **[Slow\_queries](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Slow_queries)**

The number of queries that have taken more than **[long\_query\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_long_query_time)** seconds. This counter increments regardless of whether the slow query log is enabled. For information about that log, see [Section 5.4.5, “The Slow Query Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#slow-query-log).

* **[Sort\_merge\_passes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Sort_merge_passes)**

The number of merge passes that the sort algorithm has had to do. If this value is large, you should consider increasing the value of the **[sort\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sort_buffer_size)** system variable.

* **[Sort\_range](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Sort_range)**

The number of sorts that were done using ranges.

* **[Sort\_rows](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Sort_rows)**

The number of sorted rows.

* **[Sort\_scan](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Sort_scan)**

The number of sorts that were done by scanning the table.

* **[Ssl\_accept\_renegotiates](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_accept_renegotiates)**

The number of negotiates needed to establish the connection.

* **[Ssl\_accepts](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_accepts)**

The number of accepted SSL connections.

* **[Ssl\_callback\_cache\_hits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_callback_cache_hits)**

The number of callback cache hits.

* **[Ssl\_cipher](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_cipher)**

The current encryption cipher (empty for unencrypted connections).

* **[Ssl\_cipher\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_cipher_list)**

The list of possible SSL ciphers (empty for non-SSL connections). If MySQL supports TLSv1.3, the value includes the possible TLSv1.3 ciphersuites. See [Section 6.3.2, “Encrypted Connection TLS Protocols and Ciphers”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#encrypted-connection-protocols-ciphers).

* **[Ssl\_client\_connects](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_client_connects)**

The number of SSL connection attempts to an SSL-enabled replication source server.

* **[Ssl\_connect\_renegotiates](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_connect_renegotiates)**

The number of negotiates needed to establish the connection to an SSL-enabled replication source server.

* **[Ssl\_ctx\_verify\_depth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_ctx_verify_depth)**

The SSL context verification depth (how many certificates in the chain are tested).

* **[Ssl\_ctx\_verify\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_ctx_verify_mode)**

The SSL context verification mode.

* **[Ssl\_default\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_default_timeout)**

The default SSL timeout.

* **[Ssl\_finished\_accepts](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_finished_accepts)**

The number of successful SSL connections to the server.

* **[Ssl\_finished\_connects](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_finished_connects)**

The number of successful replica connections to an SSL-enabled replication source server.

* **[Ssl\_server\_not\_after](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_server_not_after)**

The last date for which the SSL certificate is valid. To check SSL certificate expiration information, use this statement:

mysql> **SHOW STATUS LIKE 'Ssl\_server\_not%';**

+-----------------------+--------------------------+

| Variable\_name | Value |

+-----------------------+--------------------------+

| Ssl\_server\_not\_after | Apr 28 14:16:39 2025 GMT |

| Ssl\_server\_not\_before | May 1 14:16:39 2015 GMT |

+-----------------------+--------------------------+

* **[Ssl\_server\_not\_before](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_server_not_before)**

The first date for which the SSL certificate is valid.

* **[Ssl\_session\_cache\_hits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_session_cache_hits)**

The number of SSL session cache hits.

* **[Ssl\_session\_cache\_misses](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_session_cache_misses)**

The number of SSL session cache misses.

* **[Ssl\_session\_cache\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_session_cache_mode)**

The SSL session cache mode.

* **[Ssl\_session\_cache\_overflows](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_session_cache_overflows)**

The number of SSL session cache overflows.

* **[Ssl\_session\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_session_cache_size)**

The SSL session cache size.

* **[Ssl\_session\_cache\_timeouts](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_session_cache_timeouts)**

The number of SSL session cache timeouts.

* **[Ssl\_sessions\_reused](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_sessions_reused)**

How many SSL connections were reused from the cache.

* **[Ssl\_used\_session\_cache\_entries](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_used_session_cache_entries)**

How many SSL session cache entries were used.

* **[Ssl\_verify\_depth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_verify_depth)**

The verification depth for replication SSL connections.

* **[Ssl\_verify\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_verify_mode)**

The verification mode used by the server for a connection that uses SSL. The value is a bitmask; bits are defined in the openssl/ssl.h header file:

# define SSL\_VERIFY\_NONE 0x00

# define SSL\_VERIFY\_PEER 0x01

# define SSL\_VERIFY\_FAIL\_IF\_NO\_PEER\_CERT 0x02

# define SSL\_VERIFY\_CLIENT\_ONCE 0x04

**SSL\_VERIFY\_PEER** indicates that the server asks for a client certificate. If the client supplies one, the server performs verification and proceeds only if verification is successful. **SSL\_VERIFY\_CLIENT\_ONCE** indicates that a request for the client certificate is performed only in the initial handshake.

* **[Ssl\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Ssl_version)**

The SSL protocol version of the connection (for example, TLSv1). If the connection is not encrypted, the value is empty.

* **[Table\_locks\_immediate](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Table_locks_immediate)**

The number of times that a request for a table lock could be granted immediately.

* **[Table\_locks\_waited](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Table_locks_waited)**

The number of times that a request for a table lock could not be granted immediately and a wait was needed. If this is high and you have performance problems, you should first optimize your queries, and then either split your table or tables or use replication.

* **[Table\_open\_cache\_hits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Table_open_cache_hits)**

The number of hits for open tables cache lookups.

* **[Table\_open\_cache\_misses](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Table_open_cache_misses)**

The number of misses for open tables cache lookups.

* **[Table\_open\_cache\_overflows](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Table_open_cache_overflows)**

The number of overflows for the open tables cache. This is the number of times, after a table is opened or closed, a cache instance has an unused entry and the size of the instance is larger than **[table\_open\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache)** / **[table\_open\_cache\_instances](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache_instances)**.

* **[Tc\_log\_max\_pages\_used](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Tc_log_max_pages_used)**

For the memory-mapped implementation of the log that is used by **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** when it acts as the transaction coordinator for recovery of internal XA transactions, this variable indicates the largest number of pages used for the log since the server started. If the product of **[Tc\_log\_max\_pages\_used](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Tc_log_max_pages_used)** and **[Tc\_log\_page\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Tc_log_page_size)** is always significantly less than the log size, the size is larger than necessary and can be reduced. (The size is set by the [--log-tc-size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-tc-size) option. This variable is unused: It is unneeded for binary log-based recovery, and the memory-mapped recovery log method is not used unless the number of storage engines that are capable of two-phase commit and that support XA transactions is greater than one. (**InnoDB** is the only applicable engine.)

* **[Tc\_log\_page\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Tc_log_page_size)**

The page size used for the memory-mapped implementation of the XA recovery log. The default value is determined using **getpagesize()**. This variable is unused for the same reasons as described for **[Tc\_log\_max\_pages\_used](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Tc_log_max_pages_used)**.

* **[Tc\_log\_page\_waits](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Tc_log_page_waits)**

For the memory-mapped implementation of the recovery log, this variable increments each time the server was not able to commit a transaction and had to wait for a free page in the log. If this value is large, you might want to increase the log size (with the [--log-tc-size](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-tc-size) option). For binary log-based recovery, this variable increments each time the binary log cannot be closed because there are two-phase commits in progress. (The close operation waits until all such transactions are finished.)

* **[Threads\_cached](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_cached)**

The number of threads in the thread cache.

* **[Threads\_connected](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_connected)**

The number of currently open connections.

* **[Threads\_created](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_created)**

The number of threads created to handle connections. If **[Threads\_created](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_created)** is big, you may want to increase the **[thread\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_cache_size)** value. The cache miss rate can be calculated as **[Threads\_created](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_created)**/[**Connections**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#statvar_Connections).

* **[Threads\_running](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_running)**

The number of threads that are not sleeping.

* **[Uptime](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Uptime)**

The number of seconds that the server has been up.

* **[Uptime\_since\_flush\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Uptime_since_flush_status)**

The number of seconds since the most recent **FLUSH STATUS** statement.

### 5.1.11 服务端SQL模式

The MySQL server can operate in different SQL modes, and can apply these modes differently for different clients, depending on the value of the **[sql\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_mode)** system variable. DBAs can set the global SQL mode to match site server operating requirements, and each application can set its session SQL mode to its own requirements.

Modes affect the SQL syntax MySQL supports and the data validation checks it performs. This makes it easier to use MySQL in different environments and to use MySQL together with other database servers.

* [Setting the SQL Mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-setting)
* [The Most Important SQL Modes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-important)
* [Full List of SQL Modes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-full)
* [Combination SQL Modes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-combo)
* [Strict SQL Mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-strict)
* [Comparison of the IGNORE Keyword and Strict SQL Mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ignore-strict-comparison)

For answers to questions often asked about server SQL modes in MySQL, see [Section A.3, “MySQL 8.0 FAQ: Server SQL Mode”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\faqs.html#faqs-sql-modes).

When working with **InnoDB** tables, consider also the **[innodb\_strict\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_strict_mode)** system variable. It enables additional error checks for **InnoDB** tables.

#### Setting the SQL Mode

The default SQL mode in MySQL 8.0 includes these modes: [**ONLY\_FULL\_GROUP\_BY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_only_full_group_by), [**STRICT\_TRANS\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_trans_tables), [**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date), [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date), [**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero), and [**NO\_ENGINE\_SUBSTITUTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_engine_substitution).

To set the SQL mode at server startup, use the [--sql-mode="***modes***"](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_sql-mode) option on the command line, or [sql-mode="](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)***[modes](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode)***["](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode) in an option file such as my.cnf (Unix operating systems) or my.ini (Windows). ***modes*** is a list of different modes separated by commas. To clear the SQL mode explicitly, set it to an empty string using [--sql-mode=""](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_sql-mode) on the command line, or [sql-mode=""](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "option_mysqld_sql-mode) in an option file.

**Note**

MySQL installation programs may configure the SQL mode during the installation process.

If the SQL mode differs from the default or from what you expect, check for a setting in an option file that the server reads at startup.

To change the SQL mode at runtime, set the global or session **[sql\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_mode)** system variable using a [**SET**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) statement:

SET GLOBAL sql\_mode = '***modes***';

SET SESSION sql\_mode = '***modes***';

Setting the **GLOBAL** variable requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege) and affects the operation of all clients that connect from that time on. Setting the **SESSION** variable affects only the current client. Each client can change its session **[sql\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_mode)** value at any time.

To determine the current global or session **[sql\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_mode)** setting, select its value:

SELECT @@GLOBAL.sql\_mode;

SELECT @@SESSION.sql\_mode;

**Important**

**SQL mode and user-defined partitioning.** Changing the server SQL mode after creating and inserting data into partitioned tables can cause major changes in the behavior of such tables, and could lead to loss or corruption of data. It is strongly recommended that you never change the SQL mode once you have created tables employing user-defined partitioning.

When replicating partitioned tables, differing SQL modes on the source and replica can also lead to problems. For best results, you should always use the same server SQL mode on the source and replica.

For more information, see [Section 24.6, “Restrictions and Limitations on Partitioning”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\partitioning.html#partitioning-limitations).

#### The Most Important SQL Modes

The most important **[sql\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_mode)** values are probably these:

* **[ANSI](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_ansi)**

This mode changes syntax and behavior to conform more closely to standard SQL. It is one of the special [combination modes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-combo) listed at the end of this section.

* **[STRICT\_TRANS\_TABLES](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_strict_trans_tables)**

If a value could not be inserted as given into a transactional table, abort the statement. For a nontransactional table, abort the statement if the value occurs in a single-row statement or the first row of a multiple-row statement. More details are given later in this section.

* **[TRADITIONAL](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_traditional)**

Make MySQL behave like a “traditional” SQL database system. A simple description of this mode is “give an error instead of a warning” when inserting an incorrect value into a column. It is one of the special [combination modes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-combo) listed at the end of this section.

**Note**

With [**TRADITIONAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_traditional) mode enabled, an [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert) or [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) aborts as soon as an error occurs. If you are using a nontransactional storage engine, this may not be what you want because data changes made prior to the error may not be rolled back, resulting in a “partially done” update.

When this manual refers to “strict mode,” it means a mode with either or both [**STRICT\_TRANS\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_trans_tables) or [**STRICT\_ALL\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_all_tables) enabled.

#### Full List of SQL Modes

The following list describes all supported SQL modes:

* **[ALLOW\_INVALID\_DATES](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_allow_invalid_dates)**

Do not perform full checking of dates. Check only that the month is in the range from 1 to 12 and the day is in the range from 1 to 31. This may be useful for Web applications that obtain year, month, and day in three different fields and store exactly what the user inserted, without date validation. This mode applies to [**DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) and [**DATETIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns. It does not apply [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns, which always require a valid date.

With [**ALLOW\_INVALID\_DATES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_allow_invalid_dates) disabled, the server requires that month and day values be legal, and not merely in the range 1 to 12 and 1 to 31, respectively. With strict mode disabled, invalid dates such as **'2004-04-31'** are converted to **'0000-00-00'** and a warning is generated. With strict mode enabled, invalid dates generate an error. To permit such dates, enable [**ALLOW\_INVALID\_DATES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_allow_invalid_dates).

* **[ANSI\_QUOTES](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_ansi_quotes)**

Treat **"** as an identifier quote character (like the **`** quote character) and not as a string quote character. You can still use **`** to quote identifiers with this mode enabled. With [**ANSI\_QUOTES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_ansi_quotes) enabled, you cannot use double quotation marks to quote literal strings because they are interpreted as identifiers.

* **[ERROR\_FOR\_DIVISION\_BY\_ZERO](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_error_for_division_by_zero)**

The [**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero) mode affects handling of division by zero, which includes [**MOD(*N*,0)**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_mod). For data-change operations ([**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert), [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update)), its effect also depends on whether strict SQL mode is enabled.

* + If this mode is not enabled, division by zero inserts **NULL** and produces no warning.
  + If this mode is enabled, division by zero inserts **NULL** and produces a warning.
  + If this mode and strict mode are enabled, division by zero produces an error, unless **IGNORE** is given as well. For **INSERT IGNORE** and **UPDATE IGNORE**, division by zero inserts **NULL** and produces a warning.

For [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select), division by zero returns **NULL**. Enabling [**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero) causes a warning to be produced as well, regardless of whether strict mode is enabled.

[**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero) is deprecated. [**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero) is not part of strict mode, but should be used in conjunction with strict mode and is enabled by default. A warning occurs if [**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero) is enabled without also enabling strict mode or vice versa.

Because [**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero) is deprecated, you should expect it to be removed in a future MySQL release as a separate mode name and its effect included in the effects of strict SQL mode.

* **[HIGH\_NOT\_PRECEDENCE](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_high_not_precedence)**

The precedence of the [**NOT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_not) operator is such that expressions such as **NOT a BETWEEN b AND c** are parsed as **NOT (a BETWEEN b AND c)**. In some older versions of MySQL, the expression was parsed as **(NOT a) BETWEEN b AND c**. The old higher-precedence behavior can be obtained by enabling the [**HIGH\_NOT\_PRECEDENCE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_high_not_precedence) SQL mode.

mysql> **SET sql\_mode = '';**

mysql> **SELECT NOT 1 BETWEEN -5 AND 5;**

-> 0

mysql> **SET sql\_mode = 'HIGH\_NOT\_PRECEDENCE';**

mysql> **SELECT NOT 1 BETWEEN -5 AND 5;**

-> 1

* **[IGNORE\_SPACE](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_ignore_space)**

Permit spaces between a function name and the **(** character. This causes built-in function names to be treated as reserved words. As a result, identifiers that are the same as function names must be quoted as described in [Section 9.2, “Schema Object Names”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\language-structure.html#identifiers). For example, because there is a [**COUNT()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_count) function, the use of **count** as a table name in the following statement causes an error:

mysql> **CREATE TABLE count (i INT);**

ERROR 1064 (42000): You have an error in your SQL syntax

The table name should be quoted:

mysql> **CREATE TABLE `count` (i INT);**

Query OK, 0 rows affected (0.00 sec)

The [**IGNORE\_SPACE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_ignore_space) SQL mode applies to built-in functions, not to loadable functions or stored functions. It is always permissible to have spaces after a loadable function or stored function name, regardless of whether [**IGNORE\_SPACE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_ignore_space) is enabled.

For further discussion of [**IGNORE\_SPACE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_ignore_space), see [Section 9.2.5, “Function Name Parsing and Resolution”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\language-structure.html#function-resolution).

* **[NO\_AUTO\_VALUE\_ON\_ZERO](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_no_auto_value_on_zero)**

**[NO\_AUTO\_VALUE\_ON\_ZERO](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_no_auto_value_on_zero)** affects handling of **AUTO\_INCREMENT** columns. Normally, you generate the next sequence number for the column by inserting either **NULL** or **0** into it. [**NO\_AUTO\_VALUE\_ON\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_auto_value_on_zero) suppresses this behavior for **0** so that only **NULL** generates the next sequence number.

This mode can be useful if **0** has been stored in a table's **AUTO\_INCREMENT** column. (Storing **0** is not a recommended practice, by the way.) For example, if you dump the table with **[mysqldump](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqldump" \o "4.5.4 mysqldump — A Database Backup Program)** and then reload it, MySQL normally generates new sequence numbers when it encounters the **0** values, resulting in a table with contents different from the one that was dumped. Enabling [**NO\_AUTO\_VALUE\_ON\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_auto_value_on_zero) before reloading the dump file solves this problem. For this reason, **[mysqldump](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqldump" \o "4.5.4 mysqldump — A Database Backup Program)** automatically includes in its output a statement that enables [**NO\_AUTO\_VALUE\_ON\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_auto_value_on_zero).

* **[NO\_BACKSLASH\_ESCAPES](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_no_backslash_escapes)**

Enabling this mode disables the use of the backslash character (**\**) as an escape character within strings and identifiers. With this mode enabled, backslash becomes an ordinary character like any other, and the default escape sequence for [**LIKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_like) expressions is changed so that no escape character is used.

* **[NO\_DIR\_IN\_CREATE](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_no_dir_in_create)**

When creating a table, ignore all **INDEX DIRECTORY** and **DATA DIRECTORY** directives. This option is useful on replica servers.

* **[NO\_ENGINE\_SUBSTITUTION](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_no_engine_substitution)**

Control automatic substitution of the default storage engine when a statement such as [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) or [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) specifies a storage engine that is disabled or not compiled in.

By default, [**NO\_ENGINE\_SUBSTITUTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_engine_substitution) is enabled.

Because storage engines can be pluggable at runtime, unavailable engines are treated the same way:

With [**NO\_ENGINE\_SUBSTITUTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_engine_substitution) disabled, for [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) the default engine is used and a warning occurs if the desired engine is unavailable. For [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table), a warning occurs and the table is not altered.

With [**NO\_ENGINE\_SUBSTITUTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_engine_substitution) enabled, an error occurs and the table is not created or altered if the desired engine is unavailable.

* **[NO\_UNSIGNED\_SUBTRACTION](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_no_unsigned_subtraction)**

Subtraction between integer values, where one is of type **UNSIGNED**, produces an unsigned result by default. If the result would otherwise have been negative, an error results:

mysql> **SET sql\_mode = '';**

Query OK, 0 rows affected (0.00 sec)

mysql> **SELECT CAST(0 AS UNSIGNED) - 1;**

ERROR 1690 (22003): BIGINT UNSIGNED value is out of range in '(cast(0 as unsigned) - 1)'

If the [**NO\_UNSIGNED\_SUBTRACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_unsigned_subtraction) SQL mode is enabled, the result is negative:

mysql> **SET sql\_mode = 'NO\_UNSIGNED\_SUBTRACTION';**

mysql> **SELECT CAST(0 AS UNSIGNED) - 1;**

+-------------------------+

| CAST(0 AS UNSIGNED) - 1 |

+-------------------------+

| -1 |

+-------------------------+

If the result of such an operation is used to update an **UNSIGNED** integer column, the result is clipped to the maximum value for the column type, or clipped to 0 if [**NO\_UNSIGNED\_SUBTRACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_unsigned_subtraction) is enabled. With strict SQL mode enabled, an error occurs and the column remains unchanged.

When [**NO\_UNSIGNED\_SUBTRACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_unsigned_subtraction) is enabled, the subtraction result is signed, even if any operand is unsigned. For example, compare the type of column **c2** in table **t1** with that of column **c2** in table **t2**:

mysql> **SET sql\_mode='';**

mysql> **CREATE TABLE test (c1 BIGINT UNSIGNED NOT NULL);**

mysql> **CREATE TABLE t1 SELECT c1 - 1 AS c2 FROM test;**

mysql> **DESCRIBE t1;**

+-------+---------------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+-------+---------------------+------+-----+---------+-------+

| c2 | bigint(21) unsigned | NO | | 0 | |

+-------+---------------------+------+-----+---------+-------+

mysql> **SET sql\_mode='NO\_UNSIGNED\_SUBTRACTION';**

mysql> **CREATE TABLE t2 SELECT c1 - 1 AS c2 FROM test;**

mysql> **DESCRIBE t2;**

+-------+------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+-------+------------+------+-----+---------+-------+

| c2 | bigint(21) | NO | | 0 | |

+-------+------------+------+-----+---------+-------+

This means that **BIGINT UNSIGNED** is not 100% usable in all contexts. See [Section 12.11, “Cast Functions and Operators”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#cast-functions).

* **[NO\_ZERO\_DATE](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_no_zero_date)**

The [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date) mode affects whether the server permits **'0000-00-00'** as a valid date. Its effect also depends on whether strict SQL mode is enabled.

* + If this mode is not enabled, **'0000-00-00'** is permitted and inserts produce no warning.
  + If this mode is enabled, **'0000-00-00'** is permitted and inserts produce a warning.
  + If this mode and strict mode are enabled, **'0000-00-00'** is not permitted and inserts produce an error, unless **IGNORE** is given as well. For **INSERT IGNORE** and **UPDATE IGNORE**, **'0000-00-00'** is permitted and inserts produce a warning.

[**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date) is deprecated. [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date) is not part of strict mode, but should be used in conjunction with strict mode and is enabled by default. A warning occurs if [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date) is enabled without also enabling strict mode or vice versa.

Because [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date) is deprecated, you should expect it to be removed in a future MySQL release as a separate mode name and its effect included in the effects of strict SQL mode.

* **[NO\_ZERO\_IN\_DATE](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_no_zero_in_date)**

The [**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date) mode affects whether the server permits dates in which the year part is nonzero but the month or day part is 0. (This mode affects dates such as **'2010-00-01'** or **'2010-01-00'**, but not **'0000-00-00'**. To control whether the server permits **'0000-00-00'**, use the [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date) mode.) The effect of [**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date) also depends on whether strict SQL mode is enabled.

* + If this mode is not enabled, dates with zero parts are permitted and inserts produce no warning.
  + If this mode is enabled, dates with zero parts are inserted as **'0000-00-00'** and produce a warning.
  + If this mode and strict mode are enabled, dates with zero parts are not permitted and inserts produce an error, unless **IGNORE** is given as well. For **INSERT IGNORE** and **UPDATE IGNORE**, dates with zero parts are inserted as **'0000-00-00'** and produce a warning.

[**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date) is deprecated. [**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date) is not part of strict mode, but should be used in conjunction with strict mode and is enabled by default. A warning occurs if [**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date) is enabled without also enabling strict mode or vice versa.

Because [**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date) is deprecated, you should expect it to be removed in a future MySQL release as a separate mode name and its effect included in the effects of strict SQL mode.

* **[ONLY\_FULL\_GROUP\_BY](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_only_full_group_by)**

Reject queries for which the select list, **HAVING** condition, or **ORDER BY** list refer to nonaggregated columns that are neither named in the **GROUP BY** clause nor are functionally dependent on (uniquely determined by) **GROUP BY** columns.

A MySQL extension to standard SQL permits references in the **HAVING** clause to aliased expressions in the select list. The **HAVING** clause can refer to aliases regardless of whether [**ONLY\_FULL\_GROUP\_BY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_only_full_group_by) is enabled.

For additional discussion and examples, see [Section 12.20.3, “MySQL Handling of GROUP BY”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#group-by-handling).

* **[PAD\_CHAR\_TO\_FULL\_LENGTH](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_pad_char_to_full_length)**

By default, trailing spaces are trimmed from [**CHAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#char) column values on retrieval. If [**PAD\_CHAR\_TO\_FULL\_LENGTH**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_pad_char_to_full_length) is enabled, trimming does not occur and retrieved [**CHAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#char) values are padded to their full length. This mode does not apply to [**VARCHAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#char) columns, for which trailing spaces are retained on retrieval.

**Note**

As of MySQL 8.0.13, [**PAD\_CHAR\_TO\_FULL\_LENGTH**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_pad_char_to_full_length) is deprecated. Expect it to be removed in a future version of MySQL.

mysql> **CREATE TABLE t1 (c1 CHAR(10));**

Query OK, 0 rows affected (0.37 sec)

mysql> **INSERT INTO t1 (c1) VALUES('xy');**

Query OK, 1 row affected (0.01 sec)

mysql> **SET sql\_mode = '';**

Query OK, 0 rows affected (0.00 sec)

mysql> **SELECT c1, CHAR\_LENGTH(c1) FROM t1;**

+------+-----------------+

| c1 | CHAR\_LENGTH(c1) |

+------+-----------------+

| xy | 2 |

+------+-----------------+

1 row in set (0.00 sec)

mysql> **SET sql\_mode = 'PAD\_CHAR\_TO\_FULL\_LENGTH';**

Query OK, 0 rows affected (0.00 sec)

mysql> **SELECT c1, CHAR\_LENGTH(c1) FROM t1;**

+------------+-----------------+

| c1 | CHAR\_LENGTH(c1) |

+------------+-----------------+

| xy | 10 |

+------------+-----------------+

1 row in set (0.00 sec)

* **[PIPES\_AS\_CONCAT](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_pipes_as_concat)**

Treat [**||**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_or) as a string concatenation operator (same as [**CONCAT()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_concat)) rather than as a synonym for [**OR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#operator_or).

* **[REAL\_AS\_FLOAT](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_real_as_float)**

Treat [**REAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#floating-point-types) as a synonym for [**FLOAT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#floating-point-types). By default, MySQL treats [**REAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#floating-point-types) as a synonym for [**DOUBLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#floating-point-types).

* **[STRICT\_ALL\_TABLES](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_strict_all_tables)**

Enable strict SQL mode for all storage engines. Invalid data values are rejected. For details, see [Strict SQL Mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-strict).

* **[STRICT\_TRANS\_TABLES](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_strict_trans_tables)**

Enable strict SQL mode for transactional storage engines, and when possible for nontransactional storage engines. For details, see [Strict SQL Mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode-strict).

* **[TIME\_TRUNCATE\_FRACTIONAL](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_time_truncate_fractional)**

Control whether rounding or truncation occurs when inserting a [**TIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#time), [**DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime), or [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) value with a fractional seconds part into a column having the same type but fewer fractional digits. The default behavior is to use rounding. If this mode is enabled, truncation occurs instead. The following sequence of statements illustrates the difference:

CREATE TABLE t (id INT, tval TIME(1));

SET sql\_mode='';

INSERT INTO t (id, tval) VALUES(1, 1.55);

SET sql\_mode='TIME\_TRUNCATE\_FRACTIONAL';

INSERT INTO t (id, tval) VALUES(2, 1.55);

The resulting table contents look like this, where the first value has been subject to rounding and the second to truncation:

mysql> **SELECT id, tval FROM t ORDER BY id;**

+------+------------+

| id | tval |

+------+------------+

| 1 | 00:00:01.6 |

| 2 | 00:00:01.5 |

+------+------------+

See also [Section 11.2.6, “Fractional Seconds in Time Values”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#fractional-seconds).

#### Combination SQL Modes

The following special modes are provided as shorthand for combinations of mode values from the preceding list.

* **[ANSI](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_ansi)**

Equivalent to [**REAL\_AS\_FLOAT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_real_as_float), [**PIPES\_AS\_CONCAT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_pipes_as_concat), [**ANSI\_QUOTES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_ansi_quotes), [**IGNORE\_SPACE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_ignore_space), and [**ONLY\_FULL\_GROUP\_BY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_only_full_group_by).

[**ANSI**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_ansi) mode also causes the server to return an error for queries where a set function ***S*** with an outer reference ***S*(*outer\_ref*)** cannot be aggregated in the outer query against which the outer reference has been resolved. This is such a query:

SELECT \* FROM t1 WHERE t1.a IN (SELECT MAX(t1.b) FROM t2 WHERE ...);

Here, [**MAX(t1.b)**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_max) cannot aggregated in the outer query because it appears in the **WHERE** clause of that query. Standard SQL requires an error in this situation. If [**ANSI**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_ansi) mode is not enabled, the server treats ***S*(*outer\_ref*)** in such queries the same way that it would interpret ***S*(*const*)**.

See [Section 1.7, “MySQL Standards Compliance”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\introduction.html#compatibility).

* **[TRADITIONAL](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_traditional)**

**[TRADITIONAL](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sqlmode_traditional)** is equivalent to [**STRICT\_TRANS\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_trans_tables), [**STRICT\_ALL\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_all_tables), [**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date), [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date), [**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero), and [**NO\_ENGINE\_SUBSTITUTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_engine_substitution).

#### Strict SQL Mode

Strict mode controls how MySQL handles invalid or missing values in data-change statements such as [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert) or [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update). A value can be invalid for several reasons. For example, it might have the wrong data type for the column, or it might be out of range. A value is missing when a new row to be inserted does not contain a value for a non-**NULL** column that has no explicit **DEFAULT** clause in its definition. (For a **NULL** column, **NULL** is inserted if the value is missing.) Strict mode also affects DDL statements such as [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table).

If strict mode is not in effect, MySQL inserts adjusted values for invalid or missing values and produces warnings (see [Section 13.7.7.42, “SHOW WARNINGS Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-warnings)). In strict mode, you can produce this behavior by using [**INSERT IGNORE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert) or [**UPDATE IGNORE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update).

For statements such as [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) that do not change data, invalid values generate a warning in strict mode, not an error.

Strict mode produces an error for attempts to create a key that exceeds the maximum key length. When strict mode is not enabled, this results in a warning and truncation of the key to the maximum key length.

Strict mode does not affect whether foreign key constraints are checked. **[foreign\_key\_checks](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_foreign_key_checks)** can be used for that. (See [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables).)

Strict SQL mode is in effect if either [**STRICT\_ALL\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_all_tables) or [**STRICT\_TRANS\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_trans_tables) is enabled, although the effects of these modes differ somewhat:

* For transactional tables, an error occurs for invalid or missing values in a data-change statement when either [**STRICT\_ALL\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_all_tables) or [**STRICT\_TRANS\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_trans_tables) is enabled. The statement is aborted and rolled back.
* For nontransactional tables, the behavior is the same for either mode if the bad value occurs in the first row to be inserted or updated: The statement is aborted and the table remains unchanged. If the statement inserts or modifies multiple rows and the bad value occurs in the second or later row, the result depends on which strict mode is enabled:
  + For [**STRICT\_ALL\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_all_tables), MySQL returns an error and ignores the rest of the rows. However, because the earlier rows have been inserted or updated, the result is a partial update. To avoid this, use single-row statements, which can be aborted without changing the table.
  + For [**STRICT\_TRANS\_TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_strict_trans_tables), MySQL converts an invalid value to the closest valid value for the column and inserts the adjusted value. If a value is missing, MySQL inserts the implicit default value for the column data type. In either case, MySQL generates a warning rather than an error and continues processing the statement. Implicit defaults are described in [Section 11.6, “Data Type Default Values”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#data-type-defaults).

Strict mode affects handling of division by zero, zero dates, and zeros in dates as follows:

* Strict mode affects handling of division by zero, which includes [**MOD(*N*,0)**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_mod):

For data-change operations ([**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert), [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update)):

* + If strict mode is not enabled, division by zero inserts **NULL** and produces no warning.
  + If strict mode is enabled, division by zero produces an error, unless **IGNORE** is given as well. For **INSERT IGNORE** and **UPDATE IGNORE**, division by zero inserts **NULL** and produces a warning.

For [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select), division by zero returns **NULL**. Enabling strict mode causes a warning to be produced as well.

* Strict mode affects whether the server permits **'0000-00-00'** as a valid date:
  + If strict mode is not enabled, **'0000-00-00'** is permitted and inserts produce no warning.
  + If strict mode is enabled, **'0000-00-00'** is not permitted and inserts produce an error, unless **IGNORE** is given as well. For **INSERT IGNORE** and **UPDATE IGNORE**, **'0000-00-00'** is permitted and inserts produce a warning.
* Strict mode affects whether the server permits dates in which the year part is nonzero but the month or day part is 0 (dates such as **'2010-00-01'** or **'2010-01-00'**):
  + If strict mode is not enabled, dates with zero parts are permitted and inserts produce no warning.
  + If strict mode is enabled, dates with zero parts are not permitted and inserts produce an error, unless **IGNORE** is given as well. For **INSERT IGNORE** and **UPDATE IGNORE**, dates with zero parts are inserted as **'0000-00-00'** (which is considered valid with **IGNORE**) and produce a warning.

For more information about strict mode with respect to **IGNORE**, see [Comparison of the IGNORE Keyword and Strict SQL Mode](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ignore-strict-comparison).

Strict mode affects handling of division by zero, zero dates, and zeros in dates in conjunction with the [**ERROR\_FOR\_DIVISION\_BY\_ZERO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_error_for_division_by_zero), [**NO\_ZERO\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_date), and [**NO\_ZERO\_IN\_DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sqlmode_no_zero_in_date) modes.

#### Comparison of the IGNORE Keyword and Strict SQL Mode

This section compares the effect on statement execution of the **IGNORE** keyword (which downgrades errors to warnings) and strict SQL mode (which upgrades warnings to errors). It describes which statements they affect, and which errors they apply to.

The following table presents a summary comparison of statement behavior when the default is to produce an error versus a warning. An example of when the default is to produce an error is inserting a **NULL** into a **NOT NULL** column. An example of when the default is to produce a warning is inserting a value of the wrong data type into a column (such as inserting the string **'abc'** into an integer column).

| **Operational Mode** | **When Statement Default is Error** | **When Statement Default is Warning** |
| --- | --- | --- |
| **Without IGNORE or strict SQL mode** | Error | Warning |
| **With IGNORE** | Warning | Warning (same as without **IGNORE** or strict SQL mode) |
| **With strict SQL mode** | Error (same as without **IGNORE** or strict SQL mode) | Error |
| **With IGNORE and strict SQL mode** | Warning | Warning |

One conclusion to draw from the table is that when the **IGNORE** keyword and strict SQL mode are both in effect, **IGNORE** takes precedence. This means that, although **IGNORE** and strict SQL mode can be considered to have opposite effects on error handling, they do not cancel when used together.

* [The Effect of IGNORE on Statement Execution](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ignore-effect-on-execution)
* [The Effect of Strict SQL Mode on Statement Execution](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#strict-sql-mode-effect-on-execution)

##### The Effect of IGNORE on Statement Execution

Several statements in MySQL support an optional **IGNORE** keyword. This keyword causes the server to downgrade certain types of errors and generate warnings instead. For a multiple-row statement, downgrading an error to a warning may enable a row to be processed. Otherwise, **IGNORE** causes the statement to skip to the next row instead of aborting. (For nonignorable errors, an error occurs regardless of the **IGNORE** keyword.)

Example: If the table **t** has a primary key column **i** containing unique values, attempting to insert the same value of **i** into multiple rows normally produces a duplicate-key error:

mysql> **CREATE TABLE t (i INT NOT NULL PRIMARY KEY);**

mysql> **INSERT INTO t (i) VALUES(1),(1);**

ERROR 1062 (23000): Duplicate entry '1' for key 't.PRIMARY'

With **IGNORE**, the row containing the duplicate key still is not inserted, but a warning occurs instead of an error:

mysql> **INSERT IGNORE INTO t (i) VALUES(1),(1);**

Query OK, 1 row affected, 1 warning (0.01 sec)

Records: 2 Duplicates: 1 Warnings: 1

mysql> **SHOW WARNINGS;**

+---------+------+-----------------------------------------+

| Level | Code | Message |

+---------+------+-----------------------------------------+

| Warning | 1062 | Duplicate entry '1' for key 't.PRIMARY' |

+---------+------+-----------------------------------------+

1 row in set (0.00 sec)

Example: If the table **t2** has a **NOT NULL** column **id**, attempting to insert **NULL** produces an error in strict SQL mode:

mysql> **CREATE TABLE t2 (id INT NOT NULL);**

mysql> **INSERT INTO t2 (id) VALUES(1),(NULL),(3);**

ERROR 1048 (23000): Column 'id' cannot be null

mysql> **SELECT \* FROM t2;**

Empty set (0.00 sec)

If the SQL mode is not strict, **IGNORE** causes the **NULL** to be inserted as the column implicit default (0 in this case), which enables the row to be handled without skipping it:

mysql> **INSERT INTO t2 (id) VALUES(1),(NULL),(3);**

mysql> **SELECT \* FROM t2;**

+----+

| id |

+----+

| 1 |

| 0 |

| 3 |

+----+

These statements support the **IGNORE** keyword:

* [**CREATE TABLE ... SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table): **IGNORE** does not apply to the [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table) or [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) parts of the statement but to inserts into the table of rows produced by the [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select). Rows that duplicate an existing row on a unique key value are discarded.
* [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete): **IGNORE** causes MySQL to ignore errors during the process of deleting rows.
* [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert): With **IGNORE**, rows that duplicate an existing row on a unique key value are discarded. Rows set to values that would cause data conversion errors are set to the closest valid values instead.

For partitioned tables where no partition matching a given value is found, **IGNORE** causes the insert operation to fail silently for rows containing the unmatched value.

* [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data), [**LOAD XML**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-xml): With **IGNORE**, rows that duplicate an existing row on a unique key value are discarded.
* [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update): With **IGNORE**, rows for which duplicate-key conflicts occur on a unique key value are not updated. Rows updated to values that would cause data conversion errors are updated to the closest valid values instead.

The **IGNORE** keyword applies to the following ignorable errors:

[**ER\_BAD\_NULL\_ERROR**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_bad_null_error)

[**ER\_DUP\_ENTRY**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_dup_entry)

[**ER\_DUP\_ENTRY\_WITH\_KEY\_NAME**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_dup_entry_with_key_name)

[**ER\_DUP\_KEY**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_dup_key)

[**ER\_NO\_PARTITION\_FOR\_GIVEN\_VALUE**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_no_partition_for_given_value)

[**ER\_NO\_PARTITION\_FOR\_GIVEN\_VALUE\_SILENT**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_no_partition_for_given_value_silent)

[**ER\_NO\_REFERENCED\_ROW\_2**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_no_referenced_row_2)

[**ER\_ROW\_DOES\_NOT\_MATCH\_GIVEN\_PARTITION\_SET**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_row_does_not_match_given_partition_set)

[**ER\_ROW\_IS\_REFERENCED\_2**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_row_is_referenced_2)

[**ER\_SUBQUERY\_NO\_1\_ROW**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_subquery_no_1_row)

[**ER\_VIEW\_CHECK\_FAILED**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_view_check_failed)

##### The Effect of Strict SQL Mode on Statement Execution

The MySQL server can operate in different SQL modes, and can apply these modes differently for different clients, depending on the value of the **[sql\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_mode)** system variable. In “strict” SQL mode, the server upgrades certain warnings to errors.

For example, in non-strict SQL mode, inserting the string **'abc'** into an integer column results in conversion of the value to 0 and a warning:

mysql> **SET sql\_mode = '';**

Query OK, 0 rows affected (0.00 sec)

mysql> **INSERT INTO t (i) VALUES('abc');**

Query OK, 1 row affected, 1 warning (0.01 sec)

mysql> **SHOW WARNINGS;**

+---------+------+--------------------------------------------------------+

| Level | Code | Message |

+---------+------+--------------------------------------------------------+

| Warning | 1366 | Incorrect integer value: 'abc' for column 'i' at row 1 |

+---------+------+--------------------------------------------------------+

1 row in set (0.00 sec)

In strict SQL mode, the invalid value is rejected with an error:

mysql> **SET sql\_mode = 'STRICT\_ALL\_TABLES';**

Query OK, 0 rows affected (0.00 sec)

mysql> **INSERT INTO t (i) VALUES('abc');**

ERROR 1366 (HY000): Incorrect integer value: 'abc' for column 'i' at row 1

For more information about possible settings of the **[sql\_mode](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_mode)** system variable, see [Section 5.1.11, “Server SQL Modes”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sql-mode).

Strict SQL mode applies to the following statements under conditions for which some value might be out of range or an invalid row is inserted into or deleted from a table:

* [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table)
* [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table)
* [**CREATE TABLE ... SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table)
* [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete) (both single table and multiple table)
* [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert)
* [**LOAD DATA**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-data)
* [**LOAD XML**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#load-xml)
* [**SELECT SLEEP()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select)
* [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) (both single table and multiple table)

Within stored programs, individual statements of the types just listed execute in strict SQL mode if the program was defined while strict mode was in effect.

Strict SQL mode applies to the following errors, which represent a class of errors in which an input value is either invalid or missing. A value is invalid if it has the wrong data type for the column or might be out of range. A value is missing if a new row to be inserted does not contain a value for a **NOT NULL** column that has no explicit **DEFAULT** clause in its definition.

[**ER\_BAD\_NULL\_ERROR**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_bad_null_error)

[**ER\_CUT\_VALUE\_GROUP\_CONCAT**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_cut_value_group_concat)

[**ER\_DATA\_TOO\_LONG**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_data_too_long)

[**ER\_DATETIME\_FUNCTION\_OVERFLOW**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_datetime_function_overflow)

[**ER\_DIVISION\_BY\_ZERO**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_division_by_zero)

[**ER\_INVALID\_ARGUMENT\_FOR\_LOGARITHM**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_invalid_argument_for_logarithm)

[**ER\_NO\_DEFAULT\_FOR\_FIELD**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_no_default_for_field)

[**ER\_NO\_DEFAULT\_FOR\_VIEW\_FIELD**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_no_default_for_view_field)

[**ER\_TOO\_LONG\_KEY**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_too_long_key)

[**ER\_TRUNCATED\_WRONG\_VALUE**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_truncated_wrong_value)

[**ER\_TRUNCATED\_WRONG\_VALUE\_FOR\_FIELD**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_truncated_wrong_value_for_field)

[**ER\_WARN\_DATA\_OUT\_OF\_RANGE**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_warn_data_out_of_range)

[**ER\_WARN\_NULL\_TO\_NOTNULL**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_warn_null_to_notnull)

[**ER\_WARN\_TOO\_FEW\_RECORDS**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_warn_too_few_records)

[**ER\_WRONG\_ARGUMENTS**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_wrong_arguments)

[**ER\_WRONG\_VALUE\_FOR\_TYPE**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_wrong_value_for_type)

[**WARN\_DATA\_TRUNCATED**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_warn_data_truncated)

**Note**

Because continued MySQL development defines new errors, there may be errors not in the preceding list to which strict SQL mode applies.

### 5.1.12 连接管理

[5.1.12.1 Connection Interfaces](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces)

[5.1.12.2 Administrative Connection Management](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-connection-interface)

[5.1.12.3 DNS Lookups and the Host Cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache)

This section describes how MySQL Server manages connections. This includes a description of the available connection interfaces, how the server uses connection handler threads, details about the administrative connection interface, and management of DNS lookups.

#### 5.1.12.1 Connection Interfaces

This section describes aspects of how the MySQL server manages client connections.

* [Network Interfaces and Connection Manager Threads](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces-interfaces)
* [Client Connection Thread Management](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces-thread-management)
* [Connection Volume Management](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces-volume-management)

##### Network Interfaces and Connection Manager Threads

The server is capable of listening for client connections on multiple network interfaces. Connection manager threads handle client connection requests on the network interfaces that the server listens to:

* On all platforms, one manager thread handles TCP/IP connection requests.
* On Unix, the same manager thread also handles Unix socket file connection requests.
* On Windows, one manager thread handles shared-memory connection requests, and another handles named-pipe connection requests.
* On all platforms, an additional network interface may be enabled to accept administrative TCP/IP connection requests. This interface can use the manager thread that handles “ordinary” TCP/IP requests, or a separate thread.

The server does not create threads to handle interfaces that it does not listen to. For example, a Windows server that does not have support for named-pipe connections enabled does not create a thread to handle them.

Individual server plugins or components may implement their own connection interface:

* X Plugin enables MySQL Server to communicate with clients using X Protocol. See [Section 20.5, “X Plugin”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\document-store.html#x-plugin).

##### Client Connection Thread Management

Connection manager threads associate each client connection with a thread dedicated to it that handles authentication and request processing for that connection. Manager threads create a new thread when necessary but try to avoid doing so by consulting the thread cache first to see whether it contains a thread that can be used for the connection. When a connection ends, its thread is returned to the thread cache if the cache is not full.

In this connection thread model, there are as many threads as there are clients currently connected, which has some disadvantages when server workload must scale to handle large numbers of connections. For example, thread creation and disposal becomes expensive. Also, each thread requires server and kernel resources, such as stack space. To accommodate a large number of simultaneous connections, the stack size per thread must be kept small, leading to a situation where it is either too small or the server consumes large amounts of memory. Exhaustion of other resources can occur as well, and scheduling overhead can become significant.

MySQL Enterprise Edition includes a thread pool plugin that provides an alternative thread-handling model designed to reduce overhead and improve performance. It implements a thread pool that increases server performance by efficiently managing statement execution threads for large numbers of client connections. See [Section 5.6.3, “MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#thread-pool).

To control and monitor how the server manages threads that handle client connections, several system and status variables are relevant. (See [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables), and [Section 5.1.10, “Server Status Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-status-variables).)

* The **[thread\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_cache_size)** system variable determines the thread cache size. By default, the server autosizes the value at startup, but it can be set explicitly to override this default. A value of 0 disables caching, which causes a thread to be set up for each new connection and disposed of when the connection terminates. To enable ***N*** inactive connection threads to be cached, set **[thread\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_cache_size)** to ***N*** at server startup or at runtime. A connection thread becomes inactive when the client connection with which it was associated terminates.
* To monitor the number of threads in the cache and how many threads have been created because a thread could not be taken from the cache, check the **[Threads\_cached](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_cached)** and **[Threads\_created](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Threads_created)** status variables.
* When the thread stack is too small, this limits the complexity of the SQL statements the server can handle, the recursion depth of stored procedures, and other memory-consuming actions. To set a stack size of ***N*** bytes for each thread, start the server with **[thread\_stack](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_stack)** set to ***N***.

##### Connection Volume Management

To control the maximum number of clients the server permits to connect simultaneously, set the **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** system variable at server startup or at runtime. It may be necessary to increase **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** if more clients attempt to connect simultaneously then the server is configured to handle (see [Section B.3.2.5, “Too many connections”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#too-many-connections)). If the server refuses a connection because the **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** limit is reached, it increments the **[Connection\_errors\_max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_max_connections)** status variable.

[**mysqld**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysqld) actually permits **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** + 1 client connections. The extra connection is reserved for use by accounts that have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege). By granting the privilege to administrators and not to normal users (who should not need it), an administrator can connect to the server and use [**SHOW PROCESSLIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-processlist) to diagnose problems even if the maximum number of unprivileged clients are connected. See [Section 13.7.7.29, “SHOW PROCESSLIST Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-processlist).

As of MySQL 8.0.14, the server also permits administrative connections on an administrative network interface, which you can set up using a dedicated IP address and port. See [Section 5.1.12.2, “Administrative Connection Management”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-connection-interface).

The Group Replication plugin interacts with MySQL Server using internal sessions to perform SQL API operations. In releases to MySQL 8.0.18, these sessions count towards the client connections limit specified by the **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** server system variable. In those releases, if the server has reached the **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** limit when Group Replication is started or attempts to perform an operation, the operation is unsuccessful and Group Replication or the server itself might stop. From MySQL 8.0.19, Group Replication's internal sessions are handled separately from client connections, so they do not count towards the **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** limit and are not refused if the server has reached this limit.

The maximum number of client connections MySQL supports (that is, the maximum value to which **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** can be set) depends on several factors:

* The quality of the thread library on a given platform.
* The amount of RAM available.
* The amount of RAM is used for each connection.
* The workload from each connection.
* The desired response time.
* The number of file descriptors available.

Linux or Solaris should be able to support at least 500 to 1000 simultaneous connections routinely and as many as 10,000 connections if you have many gigabytes of RAM available and the workload from each is low or the response time target undemanding.

Increasing the **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** value increases the number of file descriptors that **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** requires. If the required number of descriptors are not available, the server reduces the value of **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)**. For comments on file descriptor limits, see [Section 8.4.3.1, “How MySQL Opens and Closes Tables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#table-cache).

Increasing the **[open\_files\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_open_files_limit)** system variable may be necessary, which may also require raising the operating system limit on how many file descriptors can be used by MySQL. Consult your operating system documentation to determine whether it is possible to increase the limit and how to do so. See also [Section B.3.2.16, “File Not Found and Similar Errors”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#not-enough-file-handles).

#### 5.1.12.2 Administrative Connection Management

As mentioned in [Connection Volume Management](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#connection-interfaces-volume-management), to allow for the need to perform administrative operations even when **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** connections are already established on the interfaces used for ordinary connections, the MySQL server permits a single administrative connection to users who have the [**CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_connection-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege).

Additionally, as of MySQL 8.0.14, the server permits dedicating a TCP/IP port for administrative connections, as described in the following sections.

* [Administrative Interface Characteristics](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-characteristics)
* [Administrative Interface Support for Encrypted Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#administrative-interface-encrypted-connections)

##### Administrative Interface Characteristics

The administrative connection interface has these characteristics:

* The server enables the interface only if the **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** system variable is set at startup to indicate the IP address for it. If **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)** is not set, the server maintains no administrative interface.
* The **[admin\_port](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_port)** system variable specifies the interface TCP/IP port number (default 33062).
* There is no limit on the number of administrative connections, but connections are permitted only for users who have the [**SERVICE\_CONNECTION\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_service-connection-admin) privilege.
* The **[create\_admin\_listener\_thread](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_create_admin_listener_thread)** system variable enables DBAs to choose at startup whether the administrative interface has its own separate thread. The default is **OFF**; that is, the manager thread for ordinary connections on the main interface also handles connections for the administrative interface.

These lines in the server my.cnf file enable the administrative interface on the loopback interface and configure it to use port number 33064 (that is, a port different from the default):

[mysqld]

admin\_address=127.0.0.1

admin\_port=33064

MySQL client programs connect to either the main or administrative interface by specifying appropriate connection parameters. If the server running on the local host is using the default TCP/IP port numbers of 3306 and 33062 for the main and administrative interfaces, these commands connect to those interfaces:

mysql --protocol=TCP --port=3306

mysql --protocol=TCP --port=33062

##### Administrative Interface Support for Encrypted Connections

Prior to MySQL 8.0.21, the administrative interface supports encrypted connections using the connection-encryption configuration that applies to the main interface. As of MySQL 8.0.21, the administrative interface has its own configuration parameters for encrypted connections. These correspond to the main interface parameters but enable independent configuration of encrypted connections for the administrative interface:

* The **admin\_tls\_*xxx*** and **admin\_ssl\_*xxx*** system variables are like the **tls\_*xxx*** and **ssl\_*xxx*** system variables, but they configure the TLS context for the administrative interface rather than the main interface.
* The [--admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl) option is like the [--ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ssl) option, but it enables or disables support for encrypted connections on the administrative interface rather than the main interface.

Because support for encrypted connections is enabled by default, it is normally unnecessary to specify [--admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl). As of MySQL 8.0.26, [--admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl) is deprecated and subject to removal in a future MySQL version.

For general information about configuring connection-encryption support, see [Section 6.3.1, “Configuring MySQL to Use Encrypted Connections”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#using-encrypted-connections), and [Section 6.3.2, “Encrypted Connection TLS Protocols and Ciphers”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#encrypted-connection-protocols-ciphers). That discussion is written for the main connection interface, but the parameter names are similar for the administrative connection interface. Use that discussion together with the following remarks, which provide information specific to the administrative interface.

TLS configuration for the administrative interface follows these rules:

* If [--admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl) is enabled (the default), the administrative interface supports encrypted connections. For connections on the interface, the applicable TLS context depends on whether any nondefault administrative TLS parameter is configured:
  + If all administrative TLS parameters have their default values, the administrative interface uses the same TLS context as the main interface.
  + If any administrative TLS parameter has a nondefault value, the administrative interface uses the TLS context defined by its own parameters. (This is the case if any **admin\_tls\_*xxx*** or **admin\_ssl\_*xxx*** system variable is set to a value different from its default.) If a valid TLS context cannot be created from those parameters, the administrative interface falls back to the main interface TLS context.
* If [--admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl) is disabled (for example, by specifying [--admin-ssl=OFF](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl), encrypted connections to the administrative interface are disabled. This is true even if administrative TLS parameters have nondefault values because disabling [--admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl) takes precedence.

It is also possible to disable encrypted connections on the administrative interface without specifying [--admin-ssl](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_admin-ssl) in negated form. Set the **[admin\_tls\_version](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_tls_version)** system variable to the empty value to indicate that no TLS versions are supported. For example, these lines in the server my.cnf file disable encrypted connections on the administrative interface:

[mysqld]

admin\_tls\_version=''

Examples:

* This configuration in the server my.cnf file enables the administrative interface, but does not set any of the TLS parameters specific to that interface:
* [mysqld]
* admin\_address=127.0.0.1

As a result, the administrative interface supports encrypted connections (because encryption is supported by default when the administrative interface is enabled), and uses the main interface TLS context. When clients connect to the administrative interface, they should use the same certificate and key files as for ordinary connections on the main interface. For example (enter the command on a single line):

mysql --protocol=TCP --port=33062

--ssl-ca=ca.pem

--ssl-cert=client-cert.pem

--ssl-key=client-key.pem

* This server configuration enables the administrative interface and sets the TLS certificate and key file parameters specific to that interface:
* [mysqld]
* admin\_address=127.0.0.1
* admin\_ssl\_ca=admin-ca.pem
* admin\_ssl\_cert=admin-server-cert.pem
* admin\_ssl\_key=admin-server-key.pem

As a result, the administrative interface supports encrypted connections using its own TLS context. When clients connect to the administrative interface, they should use certificate and key files specific to that interface. For example (enter the command on a single line):

mysql --protocol=TCP --port=33062

--ssl-ca=admin-ca.pem

--ssl-cert=admin-client-cert.pem

--ssl-key=admin-client-key.pem

#### 5.1.12.3 DNS Lookups and the Host Cache

The MySQL server maintains an in-memory host cache that contains information about clients: IP address, host name, and error information. The Performance Schema **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table exposes the contents of the host cache so that it can be examined using [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements. This may help you diagnose the causes of connection problems. See [Section 27.12.21.2, “The host\_cache Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-host-cache-table).

The following sections discuss how the host cache works, as well as other topics such as how to configure and monitor the cache.

* [Host Cache Operation](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache-operation)
* [Configuring the Host Cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache-configuration)
* [Monitoring the Host Cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache-monitoring)
* [Flushing the Host Cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache-flushing)
* [Dealing with Blocked Hosts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#blocked-host)

##### Host Cache Operation

The server uses the host cache only for non-localhost TCP connections. It does not use the cache for TCP connections established using a loopback interface address (for example, **127.0.0.1** or **::1**), or for connections established using a Unix socket file, named pipe, or shared memory.

The server uses the host cache for several purposes:

* By caching the results of IP-to-host name lookups, the server avoids doing a Domain Name System (DNS) lookup for each client connection. Instead, for a given host, it needs to perform a lookup only for the first connection from that host.
* The cache contains information about errors that occur during the client connection process. Some errors are considered “blocking.” If too many of these occur successively from a given host without a successful connection, the server blocks further connections from that host. The **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** system variable determines the permitted number of successive errors before blocking occurs.

For each applicable new client connection, the server uses the client IP address to check whether the client host name is in the host cache. If so, the server refuses or continues to process the connection request depending on whether or not the host is blocked. If the host is not in the cache, the server attempts to resolve the host name. First, it resolves the IP address to a host name and resolves that host name back to an IP address. Then it compares the result to the original IP address to ensure that they are the same. The server stores information about the result of this operation in the host cache. If the cache is full, the least recently used entry is discarded.

The server performs host name resolution using the gethostbyaddr() and gethostbyname() system calls.

The server handles entries in the host cache like this:

1. When the first TCP client connection reaches the server from a given IP address, a new cache entry is created to record the client IP, host name, and client lookup validation flag. Initially, the host name is set to **NULL** and the flag is false. This entry is also used for subsequent client TCP connections from the same originating IP.
2. If the validation flag for the client IP entry is false, the server attempts an IP-to-host name-to-IP DNS resolution. If that is successful, the host name is updated with the resolved host name and the validation flag is set to true. If resolution is unsuccessful, the action taken depends on whether the error is permanent or transient. For permanent failures, the host name remains **NULL** and the validation flag is set to true. For transient failures, the host name and validation flag remain unchanged. (In this case, another DNS resolution attempt occurs the next time a client connects from this IP.)
3. If an error occurs while processing an incoming client connection from a given IP address, the server updates the corresponding error counters in the entry for that IP. For a description of the errors recorded, see [Section 27.12.21.2, “The host\_cache Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-host-cache-table).

To unblock blocked hosts, flush the host cache; see [Dealing with Blocked Hosts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#blocked-host).

It is possible for a blocked host to become unblocked even without flushing the host cache if activity from other hosts occurs:

* If the cache is full when a connection arrives from a client IP not in the cache, the server discards the least recently used cache entry to make room for the new entry.
* If the discarded entry is for a blocked host, that host becomes unblocked.

Some connection errors are not associated with TCP connections, occur very early in the connection process (even before an IP address is known), or are not specific to any particular IP address (such as out-of-memory conditions). For information about these errors, check the **[Connection\_errors\_](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_xxx)*[xxx](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Connection_errors_xxx)*** status variables (see [Section 5.1.10, “Server Status Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-status-variables)).

##### Configuring the Host Cache

The host cache is enabled by default. The **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** system variable controls its size, as well as the size of the Performance Schema **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table that exposes the cache contents. The cache size can be set at server startup and changed at runtime. For example, to set the size to 100 at startup, put these lines in the server my.cnf file:

[mysqld]

host\_cache\_size=200

To change the size to 300 at runtime, do this:

SET GLOBAL host\_cache\_size=300;

Setting **host\_cache\_size** to 0, either at server startup or at runtime, disables the host cache. With the cache disabled, the server performs a DNS lookup every time a client connects.

Changing the cache size at runtime causes an implicit host cache flushing operation that clears the host cache, truncates the **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table, and unblocks any blocked hosts; see [Flushing the Host Cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache-flushing).

Using the [--skip-host-cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-host-cache) option is similar to setting the **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** system variable to 0, but **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** is more flexible because it can also be used to resize, enable, and disable the host cache at runtime, not just at server startup. Starting the server with [--skip-host-cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-host-cache) does not prevent runtime changes to the value of **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)**, but such changes have no effect and the cache is not re-enabled even if **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** is set larger than 0.

To disable DNS host name lookups, start the server with the **[skip\_name\_resolve](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_name_resolve)** system variable enabled. In this case, the server uses only IP addresses and not host names to match connecting hosts to rows in the MySQL grant tables. Only accounts specified in those tables using IP addresses can be used. (A client may not be able to connect if no account exists that specifies the client IP address.)

If you have a very slow DNS and many hosts, you might be able to improve performance either by enabling **[skip\_name\_resolve](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_name_resolve)** to disable DNS lookups, or by increasing the value of **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** to make the host cache larger.

To disallow TCP/IP connections entirely, start the server with the **[skip\_networking](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_networking)** system variable enabled.

To adjust the permitted number of successive connection errors before host blocking occurs, set the **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** system variable. For example, to set the value at startup put these lines in the server my.cnf file:

[mysqld]

max\_connect\_errors=10000

To change the value at runtime, do this:

SET GLOBAL max\_connect\_errors=10000;

##### Monitoring the Host Cache

The Performance Schema **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table exposes the contents of the host cache. This table can be examined using [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements, which may help you diagnose the causes of connection problems. For information about this table, see [Section 27.12.21.2, “The host\_cache Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-host-cache-table).

##### Flushing the Host Cache

Flushing the host cache might be advisable or desirable under these conditions:

* Some of your client hosts change IP address.
* The error message **Host '*host\_name*' is blocked** occurs for connections from legitimate hosts. (See [Dealing with Blocked Hosts](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#blocked-host).)

Flushing the host cache has these effects:

* It clears the in-memory host cache.
* It removes all rows from the Performance Schema **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table that exposes the cache contents.
* It unblocks any blocked hosts. This enables further connection attempts from those hosts.

To flush the host cache, use any of these methods:

* Change the value of the **[host\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_host_cache_size)** system variable. This requires the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege).
* Execute a [**TRUNCATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#truncate-table) statement that truncates the Performance Schema **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table. This requires the [**DROP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_drop) privilege for the table.
* Execute a [**FLUSH HOSTS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-hosts) statement. This requires the [**RELOAD**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_reload) privilege.
* Execute a **[mysqladmin flush-hosts](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqladmin" \o "4.5.2 mysqladmin — A MySQL Server Administration Program)** command. This requires the [**DROP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_drop) privilege for the Performance Schema **[host\_cache](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-host-cache-table" \o "27.12.21.2 The host_cache Table)** table or the [**RELOAD**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_reload) privilege.

##### Dealing with Blocked Hosts

The server uses the host cache to track errors that occur during the client connection process. If the following error occurs, it means that **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** has received many connection requests from the given host that were interrupted in the middle:

Host '***host\_name***' is blocked because of many connection errors.

Unblock with 'mysqladmin flush-hosts'

The value of the **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** system variable determines how many successive interrupted connection requests the server permits before blocking a host. After **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** failed requests without a successful connection, the server assumes that something is wrong (for example, that someone is trying to break in), and blocks the host from further connection requests.

To unblock blocked hosts, flush the host cache; see [Flushing the Host Cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache-flushing).

Alternatively, to avoid having the error message occur, set **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** as described in [Configuring the Host Cache](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#host-cache-configuration). The default value of **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** is 100. Increasing **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** to a large value makes it less likely that a host reaches the threshold and becomes blocked. However, if the **Host '*host\_name*' is blocked** error message occurs, first verify that there is nothing wrong with TCP/IP connections from the blocked hosts. It does no good to increase the value of **[max\_connect\_errors](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connect_errors)** if there are network problems.

### 5.1.13 IPv6 支持

[5.1.13.1 Verifying System Support for IPv6](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ipv6-system-support)

[5.1.13.2 Configuring the MySQL Server to Permit IPv6 Connections](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ipv6-server-config)

[5.1.13.3 Connecting Using the IPv6 Local Host Address](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ipv6-local-connections)

[5.1.13.4 Connecting Using IPv6 Nonlocal Host Addresses](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ipv6-remote-connections)

[5.1.13.5 Obtaining an IPv6 Address from a Broker](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ipv6-brokers)

Support for IPv6 in MySQL includes these capabilities:

* MySQL Server can accept TCP/IP connections from clients connecting over IPv6. For example, this command connects over IPv6 to the MySQL server on the local host:
* shell> **mysql -h ::1**

To use this capability, two things must be true:

* + Your system must be configured to support IPv6. See [Section 5.1.13.1, “Verifying System Support for IPv6”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ipv6-system-support).
  + The default MySQL server configuration permits IPv6 connections in addition to IPv4 connections. To change the default configuration, start the server with the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** system variable set to an appropriate value. See [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables).
* MySQL account names permit IPv6 addresses to enable DBAs to specify privileges for clients that connect to the server over IPv6. See [Section 6.2.4, “Specifying Account Names”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#account-names). IPv6 addresses can be specified in account names in statements such as [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user), [**GRANT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#grant), and [**REVOKE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#revoke). For example:
* mysql> **CREATE USER 'bill'@'::1' IDENTIFIED BY 'secret';**
* mysql> **GRANT SELECT ON mydb.\* TO 'bill'@'::1';**
* IPv6 functions enable conversion between string and internal format IPv6 address formats, and checking whether values represent valid IPv6 addresses. For example, [**INET6\_ATON()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_inet6-aton) and [**INET6\_NTOA()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_inet6-ntoa) are similar to [**INET\_ATON()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_inet-aton) and [**INET\_NTOA()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_inet-ntoa), but handle IPv6 addresses in addition to IPv4 addresses. See [Section 12.24, “Miscellaneous Functions”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#miscellaneous-functions).
* From MySQL 8.0.14, Group Replication group members can use IPv6 addresses for communications within the group. A group can contain a mix of members using IPv6 and members using IPv4. See [Section 18.5.5, “Support For IPv6 And For Mixed IPv6 And IPv4 Groups”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\group-replication.html#group-replication-ipv6).

The following sections describe how to set up MySQL so that clients can connect to the server over IPv6.

#### 5.1.13.1 Verifying System Support for IPv6

Before MySQL Server can accept IPv6 connections, the operating system on your server host must support IPv6. As a simple test to determine whether that is true, try this command:

shell> **ping6 ::1**

16 bytes from ::1, icmp\_seq=0 hlim=64 time=0.171 ms

16 bytes from ::1, icmp\_seq=1 hlim=64 time=0.077 ms

...

To produce a description of your system's network interfaces, invoke **ifconfig -a** and look for IPv6 addresses in the output.

If your host does not support IPv6, consult your system documentation for instructions on enabling it. It might be that you need only reconfigure an existing network interface to add an IPv6 address. Or a more extensive change might be needed, such as rebuilding the kernel with IPv6 options enabled.

These links may be helpful in setting up IPv6 on various platforms:

* [Windows](https://msdn.microsoft.com/en-us/library/dd163569.aspx)
* [Gentoo Linux](http://www.gentoo.org/doc/en/ipv6.xml)
* [Ubuntu Linux](https://wiki.ubuntu.com/IPv6)
* [Linux (Generic)](http://www.tldp.org/HOWTO/Linux+IPv6-HOWTO/)
* [macOS](https://support.apple.com/en-us/HT202237)

#### 5.1.13.2 Configuring the MySQL Server to Permit IPv6 Connections

The MySQL server listens on one or more network sockets for TCP/IP connections. Each socket is bound to one address, but it is possible for an address to map onto multiple network interfaces.

Set the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** system variable at server startup to specify the TCP/IP connections that a server instance accepts. As of MySQL 8.0.13, you can specify multiple values for this option, including any combination of IPv6 addresses, IPv4 addresses, and host names that resolve to IPv6 or IPv4 addresses. Alternatively, you can specify one of the wildcard address formats that permit listening on multiple network interfaces. A value of \*, which is the default, or a value of **::**, permit both IPv4 and IPv6 connections on all server host IPv4 and IPv6 interfaces. For more information, see the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** description in [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables).

#### 5.1.13.3 Connecting Using the IPv6 Local Host Address

The following procedure shows how to configure MySQL to permit IPv6 connections by clients that connect to the local server using the **::1** local host address. The instructions given here assume that your system supports IPv6.

1. Start the MySQL server with an appropriate **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** setting to permit it to accept IPv6 connections. For example, put the following lines in the server option file and restart the server:
2. [mysqld]
3. bind\_address = \*

Specifying \* (or **::**) as the value for **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** permits both IPv4 and IPv6 connections on all server host IPv4 and IPv6 interfaces. If you want to bind the server to a specific list of addresses, you can do this as of MySQL 8.0.13 by specifying a comma-separated list of values for **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)**. This example specifies the local host addresses for both IPv4 and IPv6:

[mysqld]

bind\_address = 127.0.0.1,::1

For more information, see the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** description in [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables).

1. As an administrator, connect to the server and create an account for a local user who can connect from the **::1** local IPv6 host address:
2. mysql> **CREATE USER 'ipv6user'@'::1' IDENTIFIED BY 'ipv6pass';**

For the permitted syntax of IPv6 addresses in account names, see [Section 6.2.4, “Specifying Account Names”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#account-names). In addition to the [**CREATE USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-user) statement, you can issue [**GRANT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#grant) statements that give specific privileges to the account, although that is not necessary for the remaining steps in this procedure.

1. Invoke the **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** client to connect to the server using the new account:
2. shell> **mysql -h ::1 -u ipv6user -pipv6pass**
3. Try some simple statements that show connection information:
4. mysql> **STATUS**
5. ...
6. Connection: ::1 via TCP/IP
7. ...
8. mysql> **SELECT CURRENT\_USER(), @@bind\_address;**
9. +----------------+----------------+
10. | CURRENT\_USER() | @@bind\_address |
11. +----------------+----------------+
12. | ipv6user@::1 | :: |
13. +----------------+----------------+

#### 5.1.13.4 Connecting Using IPv6 Nonlocal Host Addresses

The following procedure shows how to configure MySQL to permit IPv6 connections by remote clients. It is similar to the preceding procedure for local clients, but the server and client hosts are distinct and each has its own nonlocal IPv6 address. The example uses these addresses:

Server host: 2001:db8:0:f101::1

Client host: 2001:db8:0:f101::2

These addresses are chosen from the nonroutable address range recommended by [IANA](http://www.iana.org/assignments/ipv6-unicast-address-assignments/ipv6-unicast-address-assignments.xml) for documentation purposes and suffice for testing on your local network. To accept IPv6 connections from clients outside the local network, the server host must have a public address. If your network provider assigns you an IPv6 address, you can use that. Otherwise, another way to obtain an address is to use an IPv6 broker; see [Section 5.1.13.5, “Obtaining an IPv6 Address from a Broker”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#ipv6-brokers).

1. Start the MySQL server with an appropriate **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** setting to permit it to accept IPv6 connections. For example, put the following lines in the server option file and restart the server:
2. [mysqld]
3. bind\_address = \*

Specifying \* (or **::**) as the value for **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** permits both IPv4 and IPv6 connections on all server host IPv4 and IPv6 interfaces. If you want to bind the server to a specific list of addresses, you can do this as of MySQL 8.0.13 by specifying a comma-separated list of values for **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)**. This example specifies an IPv4 address as well as the required server host IPv6 address:

[mysqld]

bind\_address = 198.51.100.20,2001:db8:0:f101::1

For more information, see the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** description in [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables).

1. On the server host (**2001:db8:0:f101::1**), create an account for a user who can connect from the client host (**2001:db8:0:f101::2**):
2. mysql> **CREATE USER 'remoteipv6user'@'2001:db8:0:f101::2' IDENTIFIED BY 'remoteipv6pass';**
3. On the client host (**2001:db8:0:f101::2**), invoke the **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** client to connect to the server using the new account:
4. shell> **mysql -h 2001:db8:0:f101::1 -u remoteipv6user -premoteipv6pass**
5. Try some simple statements that show connection information:
6. mysql> **STATUS**
7. ...
8. Connection: 2001:db8:0:f101::1 via TCP/IP
9. ...
10. mysql> **SELECT CURRENT\_USER(), @@bind\_address;**
11. +-----------------------------------+----------------+
12. | CURRENT\_USER() | @@bind\_address |
13. +-----------------------------------+----------------+
14. | remoteipv6user@2001:db8:0:f101::2 | :: |
15. +-----------------------------------+----------------+

#### 5.1.13.5 Obtaining an IPv6 Address from a Broker

If you do not have a public IPv6 address that enables your system to communicate over IPv6 outside your local network, you can obtain one from an IPv6 broker. The [Wikipedia IPv6 Tunnel Broker page](http://en.wikipedia.org/wiki/List_of_IPv6_tunnel_brokers) lists several brokers and their features, such as whether they provide static addresses and the supported routing protocols.

After configuring your server host to use a broker-supplied IPv6 address, start the MySQL server with an appropriate **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** setting to permit the server to accept IPv6 connections. You can specify \* (or **::**) as the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** value, or bind the server to the specific IPv6 address provided by the broker. For more information, see the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)** description in [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables).

Note that if the broker allocates dynamic addresses, the address provided for your system might change the next time you connect to the broker. If so, any accounts you create that name the original address become invalid. To bind to a specific address but avoid this change-of-address problem, you might be able to arrange with the broker for a static IPv6 address.

The following example shows how to use Freenet6 as the broker and the **gogoc** IPv6 client package on Gentoo Linux.

1. Create an account at Freenet6 by visiting this URL and signing up:
2. <http://gogonet.gogo6.com>
3. After creating the account, go to this URL, sign in, and create a user ID and password for the IPv6 broker:
4. <http://gogonet.gogo6.com/page/freenet6-registration>
5. As **root**, install **gogoc**:
6. shell> **emerge gogoc**
7. Edit /etc/gogoc/gogoc.conf to set the **userid** and **password** values. For example:
8. userid=gogouser
9. passwd=gogopass
10. Start **gogoc**:
11. shell> **/etc/init.d/gogoc start**

To start **gogoc** each time your system boots, execute this command:

shell> **rc-update add gogoc default**

1. Use **ping6** to try to ping a host:
2. shell> **ping6 ipv6.google.com**
3. To see your IPv6 address:
4. shell> **ifconfig tun**

### 5.1.14 网络命名空间支持

A network namespace is a logical copy of the network stack from the host system. Network namespaces are useful for setting up containers or virtual environments. Each namespace has its own IP addresses, network interfaces, routing tables, and so forth. The default or global namespace is the one in which the host system physical interfaces exist.

Namespace-specific address spaces can lead to problems when MySQL connections cross namespaces. For example, the network address space for a MySQL instance running in a container or virtual network may differ from the address space of the host machine. This can produce phenomena such as a client connection from an address in one namespace appearing to the MySQL server to be coming from a different address, even for client and server running on the same machine. Suppose that both processes run on a host with IP address **203.0.113.10** but use different namespaces. A connection may produce a result like this:

shell> **mysql --user=admin --host=203.0.113.10 --protocol=tcp**

mysql> **SELECT USER();**

+--------------------+

| USER() |

+--------------------+

| admin@198.51.100.2 |

+--------------------+

In this case, the expected [**USER()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_user) value is **admin@203.0.113.10**. Such behavior can make it difficult to assign account permissions properly if the address from which an connection originates is not what it appears.

To address this issue, MySQL enables specifying the network namespace to use for TCP/IP connections, so that both endpoints of connections use an agreed-upon common address space.

MySQL 8.0.22 and higher supports network namespaces on platforms that implement them. Support within MySQL applies to:

* The MySQL server, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**.
* X Plugin.
* The **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** client and the **mysqlxtest** test suite client. (Other clients are not supported. They must be invoked from within the network namespace of the server to which they are to connect.)
* Regular replication. (Group Replication is not supported.)

The following sections describe how to use network namespaces in MySQL:

* [Host System Prerequisites](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#network-namespaces-host-prerequisites)
* [MySQL Configuration](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#network-namespaces-mysql-configuration)
* [Network Namespace Monitoring](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#network-namespaces-monitoring)

#### Host System Prerequisites

Prior to using network namespace support in MySQL, these host system prerequisites must be satisifed:

* The host operating system must support network namespaces. (For example, Linux.)
* Any network namespace to be used by MySQL must first be created on the host system.
* Host name resolution must be configured by the system administrator to support network namespaces.

**Note**

A known limitation is that, within MySQL, host name resolution does not work for names specified in network namespace-specific host files. For example, if the address for a host name in the **red** namespace is specified in the /etc/netns/red/hosts file, binding to the name fails on both the server and client sides. The workaround is to use the IP address rather than the host name.

* The system administrator must enable the **CAP\_SYS\_ADMIN** operating system privilege for the MySQL binaries that support network namespaces (**[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**, **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)**, **mysqlxtest**).

**Important**

Enabling **CAP\_SYS\_ADMIN** is a security sensitive operation because it enables a process to perform other privileged actions in addition to setting namespaces. For a description of its effects, see <https://man7.org/linux/man-pages/man7/capabilities.7.html>.

Because **CAP\_SYS\_ADMIN** must be enabled explicitly by the system administrator, MySQL binaries by default do not have network namespace support enabled. The system administrator should evaluate the security implications of running MySQL processes with **CAP\_SYS\_ADMIN** before enabling it.

The instructions in the following example set up network namespaces named **red** and **blue**. The names you choose may differ, as may the network addresses and interfaces on your host system.

Invoke the commands shown here either as the **root** operating system user or by prefixing each command with **sudo**. For example, to invoke the **ip** or **setcap** command if you are not **root**, use **sudo ip** or **sudo setcap**.

To configure network namespaces, use the **ip** command. For some operations, the **ip** command must execute within a particular namespace (which must already exist). In such cases, begin the command like this:

ip netns exec ***namespace\_name***

For example, this command executes within the **red** namespace to bring up the loopback interface:

ip netns exec red ip link set lo up

To add namespaces named **red** and **blue**, each with its own virtual Ethernet device used as a link between namespaces and its own loopback interface:

ip netns add red

ip link add veth-red type veth peer name vpeer-red

ip link set vpeer-red netns red

ip addr add 192.0.2.1/24 dev veth-red

ip link set veth-red up

ip netns exec red ip addr add 192.0.2.2/24 dev vpeer-red

ip netns exec red ip link set vpeer-red up

ip netns exec red ip link set lo up

ip netns add blue

ip link add veth-blue type veth peer name vpeer-blue

ip link set vpeer-blue netns blue

ip addr add 198.51.100.1/24 dev veth-blue

ip link set veth-blue up

ip netns exec blue ip addr add 198.51.100.2/24 dev vpeer-blue

ip netns exec blue ip link set vpeer-blue up

ip netns exec blue ip link set lo up

# if you want to enable inter-subnet routing...

sysctl net.ipv4.ip\_forward=1

ip netns exec red ip route add default via 192.0.2.1

ip netns exec blue ip route add default via 198.51.100.1

A diagram of the links between namespaces looks like this:

red global blue

192.0.2.2 <=> 192.0.2.1

(vpeer-red) (veth-red)

198.51.100.1 <=> 198.51.100.2

(veth-blue) (vpeer-blue)

To check which namespaces and links exist:

ip netns list

ip link list

To see the routing tables for the global and named namespaces:

ip route show

ip netns exec red ip route show

ip netns exec blue ip route show

To remove the **red** and **blue** links and namespaces:

ip link del veth-red

ip link del veth-blue

ip netns del red

ip netns del blue

sysctl net.ipv4.ip\_forward=0

So that the MySQL binaries that include network namespace support can actually use namespaces, you must grant them the **CAP\_SYS\_ADMIN** capability. The following **setcap** commands assume that you have changed location to the directory containing your MySQL binaries (adjust the pathname for your system as necessary):

cd /usr/local/mysql/bin

To grant **CAP\_SYS\_ADMIN** capability to the appropriate binaries:

setcap cap\_sys\_admin+ep ./mysqld

setcap cap\_sys\_admin+ep ./mysql

setcap cap\_sys\_admin+ep ./mysqlxtest

To check **CAP\_SYS\_ADMIN** capability:

shell> **getcap ./mysqld ./mysql ./mysqlxtest**

./mysqld = cap\_sys\_admin+ep

./mysql = cap\_sys\_admin+ep

./mysqlxtest = cap\_sys\_admin+ep

To remove **CAP\_SYS\_ADMIN** capability:

setcap -r ./mysqld

setcap -r ./mysql

setcap -r ./mysqlxtest

**Important**

If you reinstall binaries to which you have previously applied **setcap**, you must use **setcap** again. For example, if you perform an in-place MySQL upgrade, failure to grant the **CAP\_SYS\_ADMIN** capability again results in namespace-related failures. The server fails with this error for attempts to bind to an address with a named namespace:

[ERROR] [MY-013408] [Server] setns() failed with error 'Operation not permitted'

A client invoked with the [--network-namespace](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysql_network-namespace) option fails like this:

ERROR: Network namespace error: Operation not permitted

#### MySQL Configuration

Assuming that the preceding host system prerequisites have been satisfied, MySQL enables configuring the server-side namespace for the listening (inbound) side of connections and the client-side namespace for the outbound side of connections.

On the server side, the **[bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_bind_address)**, **[admin\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_admin_address)**, and **[mysqlx\_bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\document-store.html" \l "sysvar_mysqlx_bind_address)** system variables have extended syntax for specifying the network namespace to use for a given IP address or host name on which to listen for incoming connections. To specify a namespace for an address, add a slash and the namespace name. For example, a server my.cnf file might contain these lines:

[mysqld]

bind\_address = 127.0.1.1,192.0.2.2/red,198.51.100.2/blue

admin\_address = 102.0.2.2/red

mysqlx\_bind\_address = 102.0.2.2/red

These rules apply:

* A network namespace can be specified for an IP address or a host name.
* A network namespace cannot be specified for a wildcard IP address.
* For a given address, the network namespace is optional. If given, it must be specified as a **/*ns*** suffix immediately following the address.
* An address with no **/*ns*** suffix uses the host system global namespace. The global namespace is therefore the default.
* An address with a **/*ns*** suffix uses the namespace named ***ns***.
* The host system must support network namespaces and each named namespace must previously have been set up. Naming a nonexistent namespace produces an error.
* [**bind\_address**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_bind_address) and (as of MySQL 8.0.21) **[mysqlx\_bind\_address](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\document-store.html" \l "sysvar_mysqlx_bind_address)** accept a list of multiple comma-separated addresses, the variable value can specify addresses in the global namespace, in named namespaces, or a mix.

If an error occurs during server startup for attempts to use a namespace, the server does not start. If errors occur for X Plugin during plugin initialization such that it is unable to bind to any address, the plugin fails its initialization sequence and the server does not load it.

On the client side, a network namespace can be specified in these contexts:

* For the **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** client and the **mysqlxtest** test suite client, use the [--network-namespace](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysql_network-namespace) option. For example:
* mysql --host=192.0.2.2 --network-namespace=red

If the [--network-namespace](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysql_network-namespace) option is omitted, the connection uses the default (global) namespace.

* For replication connections from replica servers to source servers, use the [**CHANGE REPLICATION SOURCE TO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#change-replication-source-to) statement (from MySQL 8.0.23) or [**CHANGE MASTER TO**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#change-master-to) statement (before MySQL 8.0.23) and specify the **NETWORK\_NAMESPACE** option. For example:
* CHANGE REPLICATION SOURCE TO
* SOURCE\_HOST = '192.0.2.2',
* NETWORK\_NAMESPACE = 'red';

If the **NETWORK\_NAMESPACE** option is omitted, replication connections use the default (global) namespace.

The following example sets up a MySQL server that listens for connections in the global, **red**, and **blue** namespaces, and shows how to configure accounts that connect from the **red** and **blue** namespaces. It is assumed that the **red** and **blue** namespaces have already been created as shown in [Host System Prerequisites](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#network-namespaces-host-prerequisites).

1. Configure the server to listen on addresses in multiple namespaces. Put these lines in the server my.cnf file and start the server:
2. [mysqld]
3. bind\_address = 127.0.1.1,192.0.2.2/red,198.51.100.2/blue

The value tells the server to listen on the loopback address **127.0.0.1** in the global namespace, the address **192.0.2.2** in the **red** namespace, and the address **198.51.100.2** in the **blue** namespace.

1. Connect to the server in the global namespace and create accounts that have permission to connect from an address in the address space of each named namespace:
2. shell> **mysql -u root -h 127.0.0.1 -p**
3. Enter password: ***root\_password***
4. mysql> **CREATE USER 'red\_user'@'192.0.2.2'**
5. **IDENTIFIED BY '*red\_user\_password*';**
6. mysql> **CREATE USER 'blue\_user'@'198.51.100.2'**
7. **IDENTIFIED BY '*blue\_user\_password*';**
8. Verify that you can connect to the server in each named namespace:
9. shell> **mysql -u red\_user -h 192.0.2.2 --network-namespace=red -p**
10. Enter password: ***red\_user\_password***
11. mysql> **SELECT USER();**
12. +--------------------+
13. | USER() |
14. +--------------------+
15. | red\_user@192.0.2.2 |
16. +--------------------+
17. shell> **mysql -u blue\_user -h 198.51.100.2 --network-namespace=blue -p**
18. Enter password: ***blue\_user\_password***
19. mysql> **SELECT USER();**
20. +------------------------+
21. | USER() |
22. +------------------------+
23. | blue\_user@198.51.100.2 |
24. +------------------------+

**Note**

You might see different results from [**USER()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_user), which can return a value that includes a host name rather than an IP address if your DNS is configured to be able to resolve the address to the corresponding host name and the server is not run with the **[skip\_name\_resolve](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_skip_name_resolve)** system variable enabled.

You might also try invoking **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** without the [--network-namespace](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_mysql_network-namespace) option to see whether the connection attempt succeeds, and, if so, how the [**USER()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_user) value is affected.

#### Network Namespace Monitoring

For replication monitoring purposes, these information sources have a column that displays the applicable network namespace for connections:

* The Performance Schema **replication\_connection\_configuration** table. See [Section 27.12.11.1, “The replication\_connection\_configuration Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-replication-connection-configuration-table).
* The replica server connection metadata repository. See [Section 17.2.4.2, “Replication Metadata Repositories”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replica-logs-status).
* The [**SHOW REPLICA | SLAVE STATUS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-replica-status) statement. See [Section 13.7.7.35, “SHOW REPLICA | SLAVE STATUS Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-replica-status).

### 5.1.15 mysql服务端时区支持

This section describes the time zone settings maintained by MySQL, how to load the system tables required for named time support, how to stay current with time zone changes, and how to enable leap-second support.

Beginning with MySQL 8.0.19, time zone offsets are also supported for inserted datetime values; see [Section 11.2.2, “The DATE, DATETIME, and TIMESTAMP Types”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime), for more information.

* [Time Zone Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#time-zone-variables)
* [Populating the Time Zone Tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#time-zone-installation)
* [Staying Current with Time Zone Changes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#time-zone-upgrades)
* [Time Zone Leap Second Support](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#time-zone-leap-seconds)

For information about time zone settings in replication setups, see [Section 17.5.1.14, “Replication and System Functions”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-features-functions) and [Section 17.5.1.33, “Replication and Time Zones”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replication-features-timezone).

#### Time Zone Variables

MySQL服务器维护着几个时区设置。

- 系统时区。当服务器启动时，它试图自动确定主机的时区，并使用它来设置 system\_time\_zone 系统变量。此后该值不会改变。

要在启动时明确指定MySQL服务器的系统时区，在启动mysqld之前设置TZ环境变量。如果你使用mysqld\_safe启动服务器，它的-时间区选项提供了另一种设置系统时区的方法。TZ和-时区的允许值取决于系统。请查阅你的操作系统文档，看看哪些值是可以接受的。

- 服务器的当前时区。全局的time\_zone系统变量表示服务器当前所处的时区。最初的time\_zone值是'SYSTEM'，表示服务器的时区与系统的时区相同。

注意

如果设置为SYSTEM，每个需要计算时区的MySQL函数调用都会进行系统库调用以确定当前的系统时区。这个调用可能受到全局突变的保护，导致争用。

The initial global server time zone value can be specified explicitly at startup with the [--default-time-zone](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_default-time-zone) option on the command line, or you can use the following line in an option file:

default-time-zone='***timezone***'

If you have the [**SYSTEM\_VARIABLES\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_system-variables-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege), you can set the global server time zone value at runtime with this statement:

SET GLOBAL time\_zone = ***timezone***;

* Per-session time zones. Each client that connects has its own session time zone setting, given by the session **[time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_time_zone)** variable. Initially, the session variable takes its value from the global **[time\_zone](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_time_zone)** variable, but the client can change its own time zone with this statement:
* SET time\_zone = ***timezone***;

The session time zone setting affects display and storage of time values that are zone-sensitive. This includes the values displayed by functions such as [**NOW()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_now) or [**CURTIME()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_curtime), and values stored in and retrieved from [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns. Values for [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns are converted from the session time zone to UTC for storage, and from UTC to the session time zone for retrieval.

The session time zone setting does not affect values displayed by functions such as [**UTC\_TIMESTAMP()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_utc-timestamp) or values in [**DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime), [**TIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#time), or [**DATETIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) columns. Nor are values in those data types stored in UTC; the time zone applies for them only when converting from [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) values. If you want locale-specific arithmetic for [**DATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime), [**TIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#time), or [**DATETIME**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) values, convert them to UTC, perform the arithmetic, and then convert back.

The current global and session time zone values can be retrieved like this:

SELECT @@GLOBAL.time\_zone, @@SESSION.time\_zone;

***timezone*** values can be given in several formats, none of which are case-sensitive:

* As the value **'SYSTEM'**, indicating that the server time zone is the same as the system time zone.
* As a string indicating an offset from UTC of the form **[*H*]*H*:*MM***, prefixed with a **+** or **-**, such as **'+10:00'**, **'-6:00'**, or **'+05:30'**. A leading zero can optionally be used for hours values less than 10; MySQL prepends a leading zero when storing and retriving the value in such cases. MySQL converts **'-00:00'** or **'-0:00'** to **'+00:00'**.

Prior to MySQL 8.0.19, this value had to be in the range **'-12:59'** to **'+13:00'**, inclusive; beginning with MySQL 8.0.19, the permitted range is **'-13:59'** to **'+14:00'**, inclusive.

* As a named time zone, such as **'Europe/Helsinki'**, **'US/Eastern'**, **'MET'**, or **'UTC'**.

**Note**

Named time zones can be used only if the time zone information tables in the **mysql** database have been created and populated. Otherwise, use of a named time zone results in an error:

mysql> **SET time\_zone = 'UTC';**

ERROR 1298 (HY000): Unknown or incorrect time zone: 'UTC'

#### Populating the Time Zone Tables

Several tables in the **mysql** system schema exist to store time zone information (see [Section 5.3, “The mysql System Schema”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-schema)). The MySQL installation procedure creates the time zone tables, but does not load them. To do so manually, use the following instructions.

**Note**

Loading the time zone information is not necessarily a one-time operation because the information changes occasionally. When such changes occur, applications that use the old rules become out of date and you may find it necessary to reload the time zone tables to keep the information used by your MySQL server current. See [Staying Current with Time Zone Changes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#time-zone-upgrades).

If your system has its own zoneinfo database (the set of files describing time zones), use the **[mysql\_tzinfo\_to\_sql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql-tzinfo-to-sql" \o "4.4.4 mysql_tzinfo_to_sql — Load the Time Zone Tables)** program to load the time zone tables. Examples of such systems are Linux, macOS, FreeBSD, and Solaris. One likely location for these files is the /usr/share/zoneinfo directory. If your system has no zoneinfo database, you can use a downloadable package, as described later in this section.

To load the time zone tables from the command line, pass the zoneinfo directory path name to **[mysql\_tzinfo\_to\_sql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql-tzinfo-to-sql" \o "4.4.4 mysql_tzinfo_to_sql — Load the Time Zone Tables)** and send the output into the **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** program. For example:

mysql\_tzinfo\_to\_sql /usr/share/zoneinfo | mysql -u root -p mysql

The **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** command shown here assumes that you connect to the server using an account such as **root** that has privileges for modifying tables in the **mysql** system schema. Adjust the connection parameters as required.

[**mysql\_tzinfo\_to\_sql**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysql-tzinfo-to-sql) reads your system's time zone files and generates SQL statements from them. **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** processes those statements to load the time zone tables.

[**mysql\_tzinfo\_to\_sql**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysql-tzinfo-to-sql) also can be used to load a single time zone file or generate leap second information:

* To load a single time zone file ***tz\_file*** that corresponds to a time zone name ***tz\_name***, invoke **[mysql\_tzinfo\_to\_sql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql-tzinfo-to-sql" \o "4.4.4 mysql_tzinfo_to_sql — Load the Time Zone Tables)** like this:
* mysql\_tzinfo\_to\_sql ***tz\_file*** ***tz\_name*** | mysql -u root -p mysql

With this approach, you must execute a separate command to load the time zone file for each named zone that the server needs to know about.

* If your time zone must account for leap seconds, initialize leap second information like this, where ***tz\_file*** is the name of your time zone file:
* mysql\_tzinfo\_to\_sql --leap ***tz\_file*** | mysql -u root -p mysql

After running **[mysql\_tzinfo\_to\_sql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql-tzinfo-to-sql" \o "4.4.4 mysql_tzinfo_to_sql — Load the Time Zone Tables)**, restart the server so that it does not continue to use any previously cached time zone data.

If your system has no zoneinfo database (for example, Windows), you can use a package containing SQL statements that is available for download at the MySQL Developer Zone:

<https://dev.mysql.com/downloads/timezones.html>

**Warning**

Do not use a downloadable time zone package if your system has a zoneinfo database. Use the **[mysql\_tzinfo\_to\_sql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql-tzinfo-to-sql" \o "4.4.4 mysql_tzinfo_to_sql — Load the Time Zone Tables)** utility instead. Otherwise, you may cause a difference in datetime handling between MySQL and other applications on your system.

To use an SQL-statement time zone package that you have downloaded, unpack it, then load the unpacked file contents into the time zone tables:

mysql -u root -p mysql < ***file\_name***

Then restart the server.

**Warning**

Do not use a downloadable time zone package that contains **MyISAM** tables. That is intended for older MySQL versions. MySQL now uses **InnoDB** for the time zone tables. Trying to replace them with **MyISAM** tables causes problems.

#### Staying Current with Time Zone Changes

When time zone rules change, applications that use the old rules become out of date. To stay current, it is necessary to make sure that your system uses current time zone information is used. For MySQL, there are multiple factors to consider in staying current:

* The operating system time affects the value that the MySQL server uses for times if its time zone is set to **SYSTEM**. Make sure that your operating system is using the latest time zone information. For most operating systems, the latest update or service pack prepares your system for the time changes. Check the website for your operating system vendor for an update that addresses the time changes.
* If you replace the system's /etc/localtime time zone file with a version that uses rules differing from those in effect at **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** startup, restart **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** so that it uses the updated rules. Otherwise, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** might not notice when the system changes its time.
* If you use named time zones with MySQL, make sure that the time zone tables in the **mysql** database are up to date:
  + If your system has its own zoneinfo database, reload the MySQL time zone tables whenever the zoneinfo database is updated.
  + For systems that do not have their own zoneinfo database, check the MySQL Developer Zone for updates. When a new update is available, download it and use it to replace the content of your current time zone tables.

For instructions for both methods, see [Populating the Time Zone Tables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#time-zone-installation). **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** caches time zone information that it looks up, so after updating the time zone tables, restart **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** to make sure that it does not continue to serve outdated time zone data.

If you are uncertain whether named time zones are available, for use either as the server's time zone setting or by clients that set their own time zone, check whether your time zone tables are empty. The following query determines whether the table that contains time zone names has any rows:

mysql> **SELECT COUNT(\*) FROM mysql.time\_zone\_name;**

+----------+

| COUNT(\*) |

+----------+

| 0 |

+----------+

A count of zero indicates that the table is empty. In this case, no applications currently are using named time zones, and you need not update the tables (unless you want to enable named time zone support). A count greater than zero indicates that the table is not empty and that its contents are available to be used for named time zone support. In this case, be sure to reload your time zone tables so that applications that use named time zones can obtain correct query results.

To check whether your MySQL installation is updated properly for a change in Daylight Saving Time rules, use a test like the one following. The example uses values that are appropriate for the 2007 DST 1-hour change that occurs in the United States on March 11 at 2 a.m.

The test uses this query:

SELECT

CONVERT\_TZ('2007-03-11 2:00:00','US/Eastern','US/Central') AS time1,

CONVERT\_TZ('2007-03-11 3:00:00','US/Eastern','US/Central') AS time2;

The two time values indicate the times at which the DST change occurs, and the use of named time zones requires that the time zone tables be used. The desired result is that both queries return the same result (the input time, converted to the equivalent value in the 'US/Central' time zone).

Before updating the time zone tables, you see an incorrect result like this:

+---------------------+---------------------+

| time1 | time2 |

+---------------------+---------------------+

| 2007-03-11 01:00:00 | 2007-03-11 02:00:00 |

+---------------------+---------------------+

After updating the tables, you should see the correct result:

+---------------------+---------------------+

| time1 | time2 |

+---------------------+---------------------+

| 2007-03-11 01:00:00 | 2007-03-11 01:00:00 |

+---------------------+---------------------+

#### Time Zone Leap Second Support

Leap second values are returned with a time part that ends with **:59:59**. This means that a function such as [**NOW()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\functions.html#function_now) can return the same value for two or three consecutive seconds during the leap second. It remains true that literal temporal values having a time part that ends with **:59:60** or **:59:61** are considered invalid.

If it is necessary to search for [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) values one second before the leap second, anomalous results may be obtained if you use a comparison with **'*YYYY-MM-DD hh:mm:ss*'** values. The following example demonstrates this. It changes the session time zone to UTC so there is no difference between internal [**TIMESTAMP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\data-types.html#datetime) values (which are in UTC) and displayed values (which have time zone correction applied).

mysql> **CREATE TABLE t1 (**

**a INT,**

**ts TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,**

**PRIMARY KEY (ts)**

**);**

Query OK, 0 rows affected (0.01 sec)

mysql> **-- change to UTC**

mysql> **SET time\_zone = '+00:00';**

Query OK, 0 rows affected (0.00 sec)

mysql> **-- Simulate NOW() = '2008-12-31 23:59:59'**

mysql> **SET timestamp = 1230767999;**

Query OK, 0 rows affected (0.00 sec)

mysql> **INSERT INTO t1 (a) VALUES (1);**

Query OK, 1 row affected (0.00 sec)

mysql> **-- Simulate NOW() = '2008-12-31 23:59:60'**

mysql> **SET timestamp = 1230768000;**

Query OK, 0 rows affected (0.00 sec)

mysql> **INSERT INTO t1 (a) VALUES (2);**

Query OK, 1 row affected (0.00 sec)

mysql> **-- values differ internally but display the same**

mysql> **SELECT a, ts, UNIX\_TIMESTAMP(ts) FROM t1;**

+------+---------------------+--------------------+

| a | ts | UNIX\_TIMESTAMP(ts) |

+------+---------------------+--------------------+

| 1 | 2008-12-31 23:59:59 | 1230767999 |

| 2 | 2008-12-31 23:59:59 | 1230768000 |

+------+---------------------+--------------------+

2 rows in set (0.00 sec)

mysql> **-- only the non-leap value matches**

mysql> **SELECT \* FROM t1 WHERE ts = '2008-12-31 23:59:59';**

+------+---------------------+

| a | ts |

+------+---------------------+

| 1 | 2008-12-31 23:59:59 |

+------+---------------------+

1 row in set (0.00 sec)

mysql> **-- the leap value with seconds=60 is invalid**

mysql> **SELECT \* FROM t1 WHERE ts = '2008-12-31 23:59:60';**

Empty set, 2 warnings (0.00 sec)

To work around this, you can use a comparison based on the UTC value actually stored in the column, which has the leap second correction applied:

mysql> **-- selecting using UNIX\_TIMESTAMP value return leap value**

mysql> **SELECT \* FROM t1 WHERE UNIX\_TIMESTAMP(ts) = 1230768000;**

+------+---------------------+

| a | ts |

+------+---------------------+

| 2 | 2008-12-31 23:59:59 |

+------+---------------------+

1 row in set (0.00 sec)

### 5.1.16资源组

MySQL supports creation and management of resource groups, and permits assigning threads running within the server to particular groups so that threads execute according to the resources available to the group. Group attributes enable control over its resources, to enable or restrict resource consumption by threads in the group. DBAs can modify these attributes as appropriate for different workloads.

Currently, CPU time is a manageable resource, represented by the concept of “virtual CPU” as a term that includes CPU cores, hyperthreads, hardware threads, and so forth. The server determines at startup how many virtual CPUs are available, and database administrators with appropriate privileges can associate these CPUs with resource groups and assign threads to groups.

For example, to manage execution of batch jobs that need not execute with high priority, a DBA can create a **Batch** resource group, and adjust its priority up or down depending on how busy the server is. (Perhaps batch jobs assigned to the group should run at lower priority during the day and at higher priority during the night.) The DBA can also adjust the set of CPUs available to the group. Groups can be enabled or disabled to control whether threads are assignable to them.

The following sections describe aspects of resource group use in MySQL:

* [Resource Group Elements](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#resource-group-elements)
* [Resource Group Attributes](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#resource-group-attributes)
* [Resource Group Management](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#resource-group-management)
* [Resource Group Replication](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#resource-group-replication)
* [Resource Group Restrictions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#resource-group-restrictions)

**Important**

On some platforms or MySQL server configurations, resource groups are unavailable or have limitations. In particular, Linux systems might require a manual step for some installation methods. For details, see [Resource Group Restrictions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#resource-group-restrictions).

#### Resource Group Elements

These capabilities provide the SQL interface for resource group management in MySQL:

* SQL statements enable creating, altering, and dropping resource groups, and enable assigning threads to resource groups. An optimizer hint enables assigning individual statements to resource groups.
* Resource group privileges provide control over which users can perform resource group operations.
* The [**INFORMATION\_SCHEMA.RESOURCE\_GROUPS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-resource-groups-table) table exposes information about resource group definitions and the Performance Schema [**threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-threads-table) table shows the resource group assignment for each thread.
* Status variables provide execution counts for each management SQL statement.

#### Resource Group Attributes

Resource groups have attributes that define the group. All attributes can be set at group creation time. Some attributes are fixed at creation time; others can be modified any time thereafter.

These attributes are defined at resource group creation time and cannot be modified:

* Each group has a name. Resource group names are identifiers like table and column names, and need not be quoted in SQL statements unless they contain special characters or are reserved words. Group names are not case-sensitive and may be up to 64 characters long.
* Each group has a type, which is either **SYSTEM** or **USER**. The resource group type affects the range of priority values assignable to the group, as described later. This attribute together with the differences in permitted priorities enables system threads to be identified so as to protect them from contention for CPU resources against user threads.

System and user threads correspond to background and foreground threads as listed in the Performance Schema [**threads**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-threads-table) table.

These attributes are defined at resource group creation time and can be modified any time thereafter:

* The CPU affinity is the set of virtual CPUs the resource group can use. An affinity can be any nonempty subset of the available CPUs. If a group has no affinity, it can use all available CPUs.
* The thread priority is the execution priority for threads assigned to the resource group. Priority values range from -20 (highest priority) to 19 (lowest priority). The default priority is 0, for both system and user groups.

System groups are permitted a higher priority than user groups, ensuring that user threads never have a higher priority than system threads:

* + For system resource groups, the permitted priority range is -20 to 0.
  + For user resource groups, the permitted priority range is 0 to 19.
* Each group can be enabled or disabled, affording administrators control over thread assignment. Threads can be assigned only to enabled groups.

#### Resource Group Management

By default, there is one system group and one user group, named **SYS\_default** and **USR\_default**, respectively. These default groups cannot be dropped and their attributes cannot be modified. Each default group has no CPU affinity and priority 0.

Newly created system and user threads are assigned to the **SYS\_default** and **USR\_default** groups, respectively.

For user-defined resource groups, all attributes are assigned at group creation time. After a group has been created, its attributes can be modified, with the exception of the name and type attributes.

To create and manage user-defined resource groups, use these SQL statements:

* [**CREATE RESOURCE GROUP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-resource-group) creates a new group. See [Section 13.7.2.2, “CREATE RESOURCE GROUP Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-resource-group).
* [**ALTER RESOURCE GROUP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-resource-group) modifies an existing group. See [Section 13.7.2.1, “ALTER RESOURCE GROUP Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-resource-group).
* [**DROP RESOURCE GROUP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-resource-group) drops an existing group. See [Section 13.7.2.3, “DROP RESOURCE GROUP Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-resource-group).

Those statements require the [**RESOURCE\_GROUP\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_resource-group-admin) privilege.

To manage resource group assignments, use these capabilities:

* [**SET RESOURCE GROUP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-resource-group) assigns threads to a group. See [Section 13.7.2.4, “SET RESOURCE GROUP Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-resource-group).
* The [**RESOURCE\_GROUP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-resource-group) optimizer hint assigns individual statements to a group. See [Section 8.9.3, “Optimizer Hints”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints).

Those operations require the [**RESOURCE\_GROUP\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_resource-group-admin) or [**RESOURCE\_GROUP\_USER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_resource-group-user) privilege.

Resource group definitions are stored in the **resource\_groups** data dictionary table so that groups persist across server restarts. Because **resource\_groups** is part of the data dictionary, it is not directly accessible by users. Resource group information is available using the [**INFORMATION\_SCHEMA.RESOURCE\_GROUPS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-resource-groups-table) table, which is implemented as a view on the data dictionary table. See [Section 26.3.26, “The INFORMATION\_SCHEMA RESOURCE\_GROUPS Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-resource-groups-table).

Initially, the [**RESOURCE\_GROUPS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-resource-groups-table) table has these rows describing the default groups:

mysql> **SELECT \* FROM INFORMATION\_SCHEMA.RESOURCE\_GROUPS\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RESOURCE\_GROUP\_NAME: USR\_default

RESOURCE\_GROUP\_TYPE: USER

RESOURCE\_GROUP\_ENABLED: 1

VCPU\_IDS: 0-3

THREAD\_PRIORITY: 0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 2. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RESOURCE\_GROUP\_NAME: SYS\_default

RESOURCE\_GROUP\_TYPE: SYSTEM

RESOURCE\_GROUP\_ENABLED: 1

VCPU\_IDS: 0-3

THREAD\_PRIORITY: 0

The **THREAD\_PRIORITY** values are 0, indicating the default priority. The **VCPU\_IDS** values show a range comprising all available CPUs. For the default groups, the displayed value varies depending on the system on which the MySQL server runs.

Earlier discussion mentioned a scenario involving a resource group named **Batch** to manage execution of batch jobs that need not execute with high priority. To create such a group, use a statement similar to this:

CREATE RESOURCE GROUP Batch

TYPE = USER

VCPU = 2-3 -- assumes a system with at least 4 CPUs

THREAD\_PRIORITY = 10;

To verify that the resource group was created as expected, check the [**RESOURCE\_GROUPS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-resource-groups-table) table:

mysql> **SELECT \* FROM INFORMATION\_SCHEMA.RESOURCE\_GROUPS**

**WHERE RESOURCE\_GROUP\_NAME = 'Batch'\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RESOURCE\_GROUP\_NAME: Batch

RESOURCE\_GROUP\_TYPE: USER

RESOURCE\_GROUP\_ENABLED: 1

VCPU\_IDS: 2-3

THREAD\_PRIORITY: 10

If the **THREAD\_PRIORITY** value is 0 rather than 10, check whether your platform or system configuration limits the resource group capability; see [Resource Group Restrictions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#resource-group-restrictions).

To assign a thread to the **Batch** group, do this:

SET RESOURCE GROUP Batch FOR ***thread\_id***;

Thereafter, statements in the named thread execute with **Batch** group resources.

If a session's own current thread should be in the **Batch** group, execute this statement within the session:

SET RESOURCE GROUP Batch;

Thereafter, statements in the session execute with **Batch** group resources.

To execute a single statement using the **Batch** group, use the [**RESOURCE\_GROUP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-resource-group) optimizer hint:

INSERT /\*+ RESOURCE\_GROUP(Batch) \*/ INTO t2 VALUES(2);

Threads assigned to the **Batch** group execute with its resources, which can be modified as desired:

* For times when the system is highly loaded, decrease the number of CPUs assigned to the group, lower its priority, or (as shown) both:
* ALTER RESOURCE GROUP Batch
* VCPU = 3
* THREAD\_PRIORITY = 19;
* For times when the system is lightly loaded, increase the number of CPUs assigned to the group, raise its priority, or (as shown) both:
* ALTER RESOURCE GROUP Batch
* VCPU = 0-3
* THREAD\_PRIORITY = 0;

#### Resource Group Replication

Resource group management is local to the server on which it occurs. Resource group SQL statements and modifications to the **resource\_groups** data dictionary table are not written to the binary log and are not replicated.

#### Resource Group Restrictions

On some platforms or MySQL server configurations, resource groups are unavailable or have limitations:

* Resource groups are unavailable if the thread pool plugin is installed.
* Resource groups are unavailable on macOS, which provides no API for binding CPUs to a thread.
* On FreeBSD and Solaris, resource group thread priorities are ignored. (Effectively, all threads run at priority 0.) Attempts to change priorities result in a warning:
* mysql> **ALTER RESOURCE GROUP abc THREAD\_PRIORITY = 10;**
* Query OK, 0 rows affected, 1 warning (0.18 sec)
* mysql> **SHOW WARNINGS;**
* +---------+------+-------------------------------------------------------------+
* | Level | Code | Message |
* +---------+------+-------------------------------------------------------------+
* | Warning | 4560 | Attribute thread\_priority is ignored (using default value). |
* +---------+------+-------------------------------------------------------------+
* On Linux, resource groups thread priorities are ignored unless the **CAP\_SYS\_NICE** capability is set. Granting **CAP\_SYS\_NICE** capability to a process enables a range of privileges; consult <http://man7.org/linux/man-pages/man7/capabilities.7.html> for the full list. Please be careful when enabling this capability.

On Linux platforms using systemd and kernel support for Ambient Capabilities (Linux 4.3 or newer), the recommended way to enable **CAP\_SYS\_NICE** capability is to modify the MySQL service file and leave the **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** binary unmodified. To adjust the service file for MySQL, use this procedure:

* 1. Run the appropriate command for your platform:
     + Oracle Linux, Red Hat, and Fedora systems:
     + shell> **sudo systemctl edit mysqld**
     + SUSE, Ubuntu, and Debian systems:
     + shell> **sudo systemctl edit mysql**
  2. Using an editor, add the following text to the service file:
  3. [Service]
  4. AmbientCapabilities=CAP\_SYS\_NICE
  5. Restart the MySQL service.

If you cannot enable the **CAP\_SYS\_NICE** capability as just described, it can be set manually using the **setcap** command, specifying the path name to the **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** executable (this requires **sudo** access). You can check the capabilities using **getcap**. For example:

shell> **sudo setcap cap\_sys\_nice+ep */path/to/mysqld***

shell> **getcap */path/to/mysqld***

***/path/to/mysqld*** = cap\_sys\_nice+ep

As a safety measure, restrict execution of the **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** binary to the **root** user and users with **mysql** group membership:

shell> **sudo chown root:mysql */path/to/mysqld***

shell> **sudo chmod 0750 */path/to/mysqld***

**Important**

If manual use of **setcap** is required, it must be performed after each reinstall.

* On Windows, threads run at one of five thread priority levels. The resource group thread priority range of -20 to 19 maps onto those levels as indicated in the following table.

**Table 5.5 Resource Group Thread Priority on Windows**

| **Priority Range** | **Windows Priority Level** |
| --- | --- |
| -20 to -10 | **THREAD\_PRIORITY\_HIGHEST** |
| -9 to -1 | **THREAD\_PRIORITY\_ABOVE\_NORMAL** |
| 0 | **THREAD\_PRIORITY\_NORMAL** |
| 1 to 10 | **THREAD\_PRIORITY\_BELOW\_NORMAL** |
| 11 to 19 | **THREAD\_PRIORITY\_LOWEST** |

### 5.1.17 服务器端帮助支持

MySQL Server supports a [**HELP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#help) statement that returns information from the MySQL Reference Manual (see [Section 13.8.3, “HELP Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#help)). This information is stored in several tables in the **mysql** schema (see [Section 5.3, “The mysql System Schema”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-schema)). Proper operation of the [**HELP**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#help) statement requires that these help tables be initialized.

For a new installation of MySQL using a binary or source distribution on Unix, help-table content initialization occurs when you initialize the data directory (see [Section 2.10.1, “Initializing the Data Directory”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#data-directory-initialization)). For an RPM distribution on Linux or binary distribution on Windows, content initialization occurs as part of the MySQL installation process.

For a MySQL upgrade using a binary distribution, help-table content is upgraded automatically by the server as of MySQL 8.0.16. Prior to MySQL 8.0.16, the content is not upgraded automatically, but you can upgrade it manually. Locate the fill\_help\_tables.sql file in the share or share/mysql directory. Change location into that directory and process the file with the **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** client as follows:

mysql -u root -p mysql < fill\_help\_tables.sql

The command shown here assumes that you connect to the server using an account such as **root** that has privileges for modifying tables in the **mysql** schema. Adjust the connection parameters as required.

Prior to MySQL 8.0.16, if you are working with Git and a MySQL development source tree, the source tree contains only a “stub” version of fill\_help\_tables.sql. To obtain a non-stub copy, use one from a source or binary distribution.

**Note**

Each MySQL series has its own series-specific reference manual, so help-table content is series specific as well. This has implications for replication because help-table content should match the MySQL series. If you load MySQL 8.0 help content into a MySQL 8.0 replication server, it does not make sense to replicate that content to a replica server from a different MySQL series and for which that content is not appropriate. For this reason, as you upgrade individual servers in a replication scenario, you should upgrade each server's help tables, using the instructions given earlier. (Manual help-content upgrade is necessary only for replication servers from versions lower than 8.0.16. As mentioned in the preceding instructions, content upgrades occur automatically as of MySQL 8.0.16.)

### 5.1.18 服务器端追踪你客户端session变化

The MySQL server implements several session state trackers. A client can enable these trackers to receive notification of changes to its session state.

One use for the tracker mechanism is to provide a means for MySQL connectors and client applications to determine whether any session context is available to permit session migration from one server to another. (To change sessions in a load-balanced environment, it is necessary to detect whether there is session state to take into consideration when deciding whether a switch can be made.)

Another use for the tracker mechanism is to permit applications to know when transactions can be moved from one session to another. Transaction state tracking enables this, which is useful for applications that may wish to move transactions from a busy server to one that is less loaded. For example, a load-balancing connector managing a client connection pool could move transactions between available sessions in the pool.

However, session switching cannot be done at arbitrary times. If a session is in the middle of a transaction for which reads or writes have been done, switching to a different session implies a transaction rollback on the original session. A session switch must be done only when a transaction does not yet have any reads or writes performed within it.

Examples of when transactions might reasonably be switched:

* Immediately after [**START TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit)
* After [**COMMIT AND CHAIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit)

In addition to knowing transaction state, it is useful to know transaction characteristics, so as to use the same characteristics if the transaction is moved to a different session. The following characteristics are relevant for this purpose:

READ ONLY

READ WRITE

ISOLATION LEVEL

WITH CONSISTENT SNAPSHOT

To support the preceding session-switching activities, notification is available for these types of client session state information:

* Changes to these attributes of client session state:
  + The default schema (database).
  + Session-specific values for system variables.
  + User-defined variables.
  + Temporary tables.
  + Prepared statements.

The **[session\_track\_state\_change](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_state_change)** system variable controls this tracker.

* Changes to the default schema name. The **[session\_track\_schema](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_schema)** system variable controls this tracker.
* Changes to the session values of system variables. The **[session\_track\_system\_variables](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_system_variables)** system variable controls this tracker.
* Available GTIDs. The **[session\_track\_gtids](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_gtids)** system variable controls this tracker.
* Information about transaction state and characteristics. The **[session\_track\_transaction\_info](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_session_track_transaction_info)** system variable controls this tracker.

For descriptions of the tracker-related system variables, see [Section 5.1.8, “Server System Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-system-variables). Those system variables permit control over which change notifications occur, but do not provide a way to access notification information. Notification occurs in the MySQL client/server protocol, which includes tracker information in OK packets so that session state changes can be detected. To enable client applications to extract state-change information from OK packets returned by the server, the MySQL C API provides a pair of functions:

* [**mysql\_session\_track\_get\_first()**](https://dev.mysql.com/doc/c-api/8.0/en/mysql-session-track-get-first.html) fetches the first part of the state-change information received from the server. See [mysql\_session\_track\_get\_first()](https://dev.mysql.com/doc/c-api/8.0/en/mysql-session-track-get-first.html" \t "_top).
* [**mysql\_session\_track\_get\_next()**](https://dev.mysql.com/doc/c-api/8.0/en/mysql-session-track-get-next.html) fetches any remaining state-change information received from the server. Following a successful call to **[mysql\_session\_track\_get\_first()](https://dev.mysql.com/doc/c-api/8.0/en/mysql-session-track-get-first.html" \t "_top)**, call this function repeatedly as long as it returns success. See [mysql\_session\_track\_get\_next()](https://dev.mysql.com/doc/c-api/8.0/en/mysql-session-track-get-next.html" \t "_top).

The **mysqltest** program has **disable\_session\_track\_info** and **enable\_session\_track\_info** commands that control whether session tracker notifications occur. You can use these commands to see from the command line what notifications SQL statements produce. Suppose that a file testscript contains the following **mysqltest** script:

DROP TABLE IF EXISTS test.t1;

CREATE TABLE test.t1 (i INT, f FLOAT);

--enable\_session\_track\_info

SET @@SESSION.session\_track\_schema=ON;

SET @@SESSION.session\_track\_system\_variables='\*';

SET @@SESSION.session\_track\_state\_change=ON;

USE information\_schema;

SET NAMES 'utf8mb4';

SET @@SESSION.session\_track\_transaction\_info='CHARACTERISTICS';

SET TRANSACTION ISOLATION LEVEL SERIALIZABLE;

SET TRANSACTION READ WRITE;

START TRANSACTION;

SELECT 1;

INSERT INTO test.t1 () VALUES();

INSERT INTO test.t1 () VALUES(1, RAND());

COMMIT;

Run the script as follows to see the information provided by the enabled trackers. For a description of the **Tracker:** information displayed by **mysqltest** for the various trackers, see [mysql\_session\_track\_get\_first()](https://dev.mysql.com/doc/c-api/8.0/en/mysql-session-track-get-first.html" \t "_top).

shell> **mysqltest < testscript**

DROP TABLE IF EXISTS test.t1;

CREATE TABLE test.t1 (i INT, f FLOAT);

SET @@SESSION.session\_track\_schema=ON;

SET @@SESSION.session\_track\_system\_variables='\*';

-- Tracker : SESSION\_TRACK\_SYSTEM\_VARIABLES

-- session\_track\_system\_variables

-- \*

SET @@SESSION.session\_track\_state\_change=ON;

-- Tracker : SESSION\_TRACK\_SYSTEM\_VARIABLES

-- session\_track\_state\_change

-- ON

USE information\_schema;

-- Tracker : SESSION\_TRACK\_SCHEMA

-- information\_schema

-- Tracker : SESSION\_TRACK\_STATE\_CHANGE

-- 1

SET NAMES 'utf8mb4';

-- Tracker : SESSION\_TRACK\_SYSTEM\_VARIABLES

-- character\_set\_client

-- utf8mb4

-- character\_set\_connection

-- utf8mb4

-- character\_set\_results

-- utf8mb4

-- Tracker : SESSION\_TRACK\_STATE\_CHANGE

-- 1

SET @@SESSION.session\_track\_transaction\_info='CHARACTERISTICS';

-- Tracker : SESSION\_TRACK\_SYSTEM\_VARIABLES

-- session\_track\_transaction\_info

-- CHARACTERISTICS

-- Tracker : SESSION\_TRACK\_STATE\_CHANGE

-- 1

-- Tracker : SESSION\_TRACK\_TRANSACTION\_CHARACTERISTICS

--

-- Tracker : SESSION\_TRACK\_TRANSACTION\_STATE

-- \_\_\_\_\_\_\_\_

SET TRANSACTION ISOLATION LEVEL SERIALIZABLE;

-- Tracker : SESSION\_TRACK\_TRANSACTION\_CHARACTERISTICS

-- SET TRANSACTION ISOLATION LEVEL SERIALIZABLE;

SET TRANSACTION READ WRITE;

-- Tracker : SESSION\_TRACK\_TRANSACTION\_CHARACTERISTICS

-- SET TRANSACTION ISOLATION LEVEL SERIALIZABLE; SET TRANSACTION READ WRITE;

START TRANSACTION;

-- Tracker : SESSION\_TRACK\_TRANSACTION\_CHARACTERISTICS

-- SET TRANSACTION ISOLATION LEVEL SERIALIZABLE; START TRANSACTION READ WRITE;

-- Tracker : SESSION\_TRACK\_TRANSACTION\_STATE

-- T\_\_\_\_\_\_\_

SELECT 1;

1

1

-- Tracker : SESSION\_TRACK\_TRANSACTION\_STATE

-- T\_\_\_\_\_S\_

INSERT INTO test.t1 () VALUES();

-- Tracker : SESSION\_TRACK\_TRANSACTION\_STATE

-- T\_\_\_W\_S\_

INSERT INTO test.t1 () VALUES(1, RAND());

-- Tracker : SESSION\_TRACK\_TRANSACTION\_STATE

-- T\_\_\_WsS\_

COMMIT;

-- Tracker : SESSION\_TRACK\_TRANSACTION\_CHARACTERISTICS

--

-- Tracker : SESSION\_TRACK\_TRANSACTION\_STATE

-- \_\_\_\_\_\_\_\_

ok

Preceding the [**START TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) statement, two [**SET TRANSACTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-transaction) statements execute that set the isolation level and access mode characteristics for the next transaction. The **SESSION\_TRACK\_TRANSACTION\_CHARACTERISTICS** value indicates those next-transaction values that have been set.

Following the [**COMMIT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#commit) statement that ends the transaction, the **SESSION\_TRACK\_TRANSACTION\_CHARACTERISTICS** value is reported as empty. This indicates that the next-transaction characteristics that were set preceding the start of the transaction have been reset, and that the session defaults apply. To track changes to those session defaults, track the session values of the **[transaction\_isolation](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_isolation)** and **[transaction\_read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_transaction_read_only)** system variables.

### 5.1.19 服务端关闭进程

The server shutdown process takes place as follows:

1. The shutdown process is initiated.

This can occur initiated several ways. For example, a user with the [**SHUTDOWN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_shutdown) privilege can execute a **[mysqladmin shutdown](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqladmin" \o "4.5.2 mysqladmin — A MySQL Server Administration Program)** command. **[mysqladmin](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqladmin" \o "4.5.2 mysqladmin — A MySQL Server Administration Program)** can be used on any platform supported by MySQL. Other operating system-specific shutdown initiation methods are possible as well: The server shuts down on Unix when it receives a **SIGTERM** signal. A server running as a service on Windows shuts down when the services manager tells it to.

1. The server creates a shutdown thread if necessary.

Depending on how shutdown was initiated, the server might create a thread to handle the shutdown process. If shutdown was requested by a client, a shutdown thread is created. If shutdown is the result of receiving a **SIGTERM** signal, the signal thread might handle shutdown itself, or it might create a separate thread to do so. If the server tries to create a shutdown thread and cannot (for example, if memory is exhausted), it issues a diagnostic message that appears in the error log:

Error: Can't create thread to kill server

1. The server stops accepting new connections.

To prevent new activity from being initiated during shutdown, the server stops accepting new client connections by closing the handlers for the network interfaces to which it normally listens for connections: the TCP/IP port, the Unix socket file, the Windows named pipe, and shared memory on Windows.

1. The server terminates current activity.

For each thread associated with a client connection, the server breaks the connection to the client and marks the thread as killed. Threads die when they notice that they are so marked. Threads for idle connections die quickly. Threads that currently are processing statements check their state periodically and take longer to die. For additional information about thread termination, see [Section 13.7.8.4, “KILL Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#kill), in particular for the instructions about killed [**REPAIR TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#repair-table) or [**OPTIMIZE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#optimize-table) operations on **MyISAM** tables.

For threads that have an open transaction, the transaction is rolled back. If a thread is updating a nontransactional table, an operation such as a multiple-row [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) or [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert) may leave the table partially updated because the operation can terminate before completion.

If the server is a replication source server, it treats threads associated with currently connected replicas like other client threads. That is, each one is marked as killed and exits when it next checks its state.

If the server is a replica server, it stops the replication I/O and SQL threads, if they are active, before marking client threads as killed. The SQL thread is permitted to finish its current statement (to avoid causing replication problems), and then stops. If the SQL thread is in the middle of a transaction at this point, the server waits until the current replication event group (if any) has finished executing, or until the user issues a [**KILL QUERY**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#kill) or [**KILL CONNECTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#kill) statement. See also [Section 13.4.2.10, “STOP SLAVE | REPLICA Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#stop-slave). Since nontransactional statements cannot be rolled back, in order to guarantee crash-safe replication, only transactional tables should be used.

**Note**

To guarantee crash safety on the replica, you must run the replica with [--relay-log-recovery](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_relay_log_recovery) enabled.

See also [Section 17.2.4, “Relay Log and Replication Metadata Repositories”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#replica-logs)).

1. The server shuts down or closes storage engines.

At this stage, the server flushes the table cache and closes all open tables.

Each storage engine performs any actions necessary for tables that it manages. **InnoDB** flushes its buffer pool to disk (unless **[innodb\_fast\_shutdown](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\innodb-storage-engine.html" \l "sysvar_innodb_fast_shutdown)** is 2), writes the current LSN to the tablespace, and terminates its own internal threads. **MyISAM** flushes any pending index writes for a table.

1. The server exits.

To provide information to management processes, the server returns one of the exit codes described in the following list. The phrase in parentheses indicates the action taken by systemd in response to the code, for platforms on which systemd is used to manage the server.

* 0 = successful termination (no restart done)
* 1 = unsuccessful termination (no restart done)
* 2 = unsuccessful termination (restart done)

## 5.2 MySQL数据目录

由MySQL服务器管理的信息存储在一个被称为数据目录的目录下。下面的列表简要地描述了通常在数据目录中发现的项目，并附有其他信息的交叉参考。

- 数据目录的子目录。数据目录的每个子目录是一个数据库目录，对应于服务器管理的一个数据库。所有MySQL安装都有某些标准数据库。

o mysql目录对应于mysql系统模式，它包含MySQL服务器运行时需要的信息。这个数据库包含数据字典表和系统表。参见第5.3节，"mysql系统模式"。

o performance\_schema目录与Performance Schema相对应，它提供了用于在运行时检查服务器内部执行情况的信息。参见第27章，MySQL性能模式。

o sys目录与sys模式相对应，它提供了一组对象，以帮助更容易地解释性能模式信息。参见第28章，MySQL sys schema。

o ndbinfo目录与ndbinfo数据库相对应，它存储了NDB Cluster的特定信息（只存在于包含NDB Cluster的安装中）。参见章节 23.5.14, "ndbinfo: NDB Cluster信息数据库"。

其他子目录对应于由用户或应用程序创建的数据库。

注意

INFORMATION\_SCHEMA是一个标准的数据库，但是其实现没有使用相应的数据库目录。

- 由服务器编写的日志文件。见第5.4节，"MySQL服务器日志"。

- InnoDB表空间和日志文件。见第15章，InnoDB存储引擎。

- 默认/自动生成的SSL和RSA证书和密钥文件。见第6.3.3节，"创建SSL和RSA证书和密钥"。

- 服务器进程ID文件（当服务器正在运行时）。

- mysqld-auto.cnf文件，存储持久化的全局系统变量设置。参见第13.7.6.1节，"变量分配的SET语法"。

前面列表中的一些项目可以通过重新配置服务器而被重新安置在其他地方。此外，--datadir选项使数据目录本身的位置可以被改变。对于一个给定的MySQL安装，检查服务器配置以确定项目是否已被移动。

## 5.3 mysql系统模式

mysql模式是系统模式。它包含存储MySQL服务器运行时所需信息的表。一个广泛的分类是，mysql模式包含存储数据库对象元数据的数据字典表，以及用于其他操作目的的系统表。下面的讨论将系统表的集合进一步细分为更小的类别。

- 数据字典表

- 授权系统表

- 对象信息系统表

- 日志系统表

- 服务器端帮助系统表

- 时区系统表

- 复制系统表

- 优化器系统表

- 其他系统表

本节的其余部分列举了每个类别中的表，并附有其他信息的交叉参考。除非另有说明，数据字典表和系统表使用InnoDB存储引擎。

mysql系统表和数据字典表驻留在MySQL数据目录中名为mysql.ibd的单一InnoDB表空间文件中。以前，这些表是在mysql数据库目录下的单个表空间文件中创建的。

可以为mysql系统模式表空间启用静态数据加密。欲了解更多信息，请参见第15.13节 "InnoDB静态数据加密"。

数据字典表

这些表组成了数据字典，它包含关于数据库对象的元数据。有关其他信息，请参见第14章，MySQL数据字典。

重要信息

数据字典是MySQL 8.0中的新内容。与以前的MySQL版本相比，启用了数据字典的服务器需要一些一般的操作差异。详情请见第14.7节 "数据字典使用的差异"。此外，对于从MySQL 5.7升级到MySQL 8.0，升级过程与以前的MySQL版本有些不同，需要你通过检查特定的先决条件来验证安装的升级准备情况。欲了解更多信息，请参阅第2.11节 "升级MySQL"，特别是第2.11.5节 "为升级准备你的安装"。

- 目录。目录信息。

- character\_sets。关于可用字符集的信息。

- check\_constraints。关于在表上定义的CHECK约束的信息。参见第13.1.20.6节，"CHECK约束"。

- collations。关于每个字符集的拼写的信息。

- column\_statistics: 列值的柱状图统计。参见章节8.9.6, "优化器统计"。

- column\_type\_elements。关于列所使用的类型的信息。

- 列。有关表内列的信息。

- dd\_properties。一个标识数据字典属性的表，例如它的版本。服务器用它来确定数据字典是否必须升级到一个新的版本。

- events。关于Event Scheduler事件的信息。参见第25.4节，"使用事件调度器"。如果服务器以--skip-grant-tables选项启动，事件调度器被禁用，在表中注册的事件不会运行。参见第25.4.2节，"事件调度器的配置"。

- foreign\_keys, foreign\_key\_column\_usage: 关于外键的信息。

- index\_column\_usage。有关索引使用的列的信息。

- index\_partitions。有关索引使用的分区的信息。

- index\_stats。用于存储在执行ANALYZE TABLE时产生的动态索引统计数据。

- indexes: 关于表的索引的信息。

- innodb\_ddl\_log。存储用于崩溃安全的DDL操作的DDL日志。

- parameter\_type\_elements: 关于存储过程和函数参数的信息，以及关于存储函数返回值的信息。

- 参数。有关存储过程和函数的信息。参见第25.2节 "使用存储的程序"。

- resource\_groups: 关于资源组的信息。参见章节5.1.16, "资源组"。

- routines: 关于存储过程和函数的信息。参见第25.2节 "使用存储的例程"。

- schemata：关于schemata的信息。在MySQL中，模式是一个数据库，所以这个表提供了关于数据库的信息。

- st\_spatial\_reference\_systems。关于空间数据的可用空间参考系统的信息。

- table\_partition\_values: 关于表分区所使用的值的信息。

- table\_partitions: 有关表所使用的分区的信息。

- table\_stats: 当执行ANALYZE TABLE时产生的关于动态表统计的信息。

- tables: 关于数据库中的表的信息。

- tablespace\_files: 关于表空间使用的文件的信息。

- tablespaces: 关于活跃的表空间的信息。

- 触发器。关于触发器的信息。

- view\_routine\_usage: 关于视图和它们所使用的存储函数之间的依赖关系的信息。

- view\_table\_usage: 用于跟踪视图和其底层表之间的依赖关系。

数据字典表是不可见的。它们不能被SELECT读取，不会出现在SHOW TABLES的输出中，也不会在INFORMATION\_SCHEMA.TABLES表中列出，等等。然而，在大多数情况下，有相应的 INFORMATION\_SCHEMA 表可以被查询。从概念上讲，INFORMATION\_SCHEMA提供了一个视图，MySQL通过它来暴露数据字典元数据。例如，你不能直接从mysql.schemata表中选择。

mysql> **SELECT \* FROM mysql.schemata;**

ERROR 3554 (HY000): Access to data dictionary table 'mysql.schemata' is rejected.

相反，从相应的INFORMATION\_SCHEMA表中选择该信息。

mysql> **SELECT \* FROM INFORMATION\_SCHEMA.SCHEMATA\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

CATALOG\_NAME: def

SCHEMA\_NAME: mysql

DEFAULT\_CHARACTER\_SET\_NAME: utf8mb4

DEFAULT\_COLLATION\_NAME: utf8mb4\_0900\_ai\_ci

SQL\_PATH: NULL

DEFAULT\_ENCRYPTION: NO

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 2. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

CATALOG\_NAME: def

SCHEMA\_NAME: information\_schema

DEFAULT\_CHARACTER\_SET\_NAME: utf8

DEFAULT\_COLLATION\_NAME: utf8\_general\_ci

SQL\_PATH: NULL

DEFAULT\_ENCRYPTION: NO

...

没有与mysql.indexes完全对应的INFORMATION\_SCHEMA表，但是INFORMATION\_SCHEMA.STATISTICS包含很多相同的信息。

到目前为止，还没有与mysql.foreign\_keys, mysql.foreign\_key\_column\_usage完全对应的INFORMATION\_SCHEMA表。获取外键信息的标准SQL方法是使用INFORMATION\_SCHEMA REFERENTIAL\_CONSTRAINTS和KEY\_COLUMN\_USAGE表；这些表现在被实现为foreign\_keys、foreign\_key\_column\_usage和其他数据字典表的视图。

MySQL 8.0之前的一些系统表已经被数据字典表所取代，并且不再出现在mysql系统模式中。

- 事件数据字典表取代了MySQL 8.0之前的事件表。

- 参数和例程数据字典表一起取代了MySQL 8.0之前的proc表。

### Grant 系统表

这些系统表包含了关于用户账户和他们所拥有的权限的授予信息。关于这些表的结构、内容和用途的其他信息，请参见第6.2.3节 "授予表"。

从MySQL 8.0开始，授予表是InnoDB（事务性）表。以前，这些是MyISAM（非交易型）表。授予表存储引擎的变化是MySQL 8.0中对账户管理语句（如CREATE USER和GRANT）行为的相应变化。以前，一个名为多个用户的账户管理语句可能对一些用户成功，而对其他用户失败。现在，这些语句是事务性的，要么对所有指定的用户成功，要么回滚，如果发生任何错误则没有影响。

注意

如果MySQL从旧版本升级，但授予表还没有从MyISAM升级到InnoDB，服务器认为它们是只读的，并且账户管理语句产生错误。关于升级说明，见第2.11节，"升级MySQL"。

- 用户。用户账户、全局权限和其他非权限列。

- global\_grants。对用户的动态全局权限的分配；见静态与动态权限。

- db。数据库级别的权限。

- tables\_priv: 表级权限。

- columns\_priv: 列级权限。

- procs\_priv: 存储过程和函数的权限。

- proxies\_priv: 代理用户的权限。

- default\_roles: 这个表列出了在用户连接和验证后，或者执行SET ROLE DEFAULT后激活的默认角色。

- role\_edges: 这个表列出了角色子图的边。

一个给定的用户表行可能指的是一个用户帐户或一个角色。服务器可以通过查询role\_edges表的认证ID之间的关系来区分一个行是代表一个用户帐户，一个角色，还是两者。

- password\_history: 有关密码变化的信息。

对象信息系统表

这些系统表包含关于组件、可加载函数和服务器端插件的信息。

- 组件。使用INSTALL COMPONENT安装的服务器组件的注册表。在这个表中列出的任何组件都是在服务器启动顺序中由加载器服务安装的。参见第5.5.1节，"安装和卸载组件"。

- func: 使用CREATE FUNCTION安装的可加载函数的注册表。在正常的启动顺序中，服务器会加载在这个表中注册的函数。如果服务器在启动时使用了 --skip-grant-tables 选项，那么在该表中注册的函数将不会被加载，并且不可用。参见章节5.7.1, "安装和卸载可加载函数"。

注意

与mysql.func系统表一样，Performance Schema user\_defined\_functions表列出了使用CREATE FUNCTION安装的可加载函数。与mysql.func表不同，user\_defined\_functions表也列出了由服务器组件或插件自动安装的函数。这个区别使得user\_defined\_functions比mysql.func更适合用于检查哪些函数被安装。参见第27.12.21.8节，"user\_defined\_functions表"。

- plugin。使用INSTALL PLUGIN安装的服务器端插件的注册表。在正常的启动顺序中，服务器会加载在这个表中注册的插件。如果服务器在启动时使用了 --skip-grant-tables 选项，那么在该表中注册的插件将不会被加载，并且不可用。参见第5.6.1节，"安装和卸载插件"。

日志系统表

服务器使用这些系统表进行日志记录。

- general\_log。一般的查询日志表。

- slow\_log。慢速查询日志表。

日志表使用CSV存储引擎。

欲了解更多信息，请参见第5.4节 "MySQL服务器日志"。

服务器端帮助系统表

这些系统表包含服务器端的帮助信息。

- help\_category。关于帮助类别的信息。

- help\_keyword：与帮助主题相关的关键词。

- help\_relation。帮助关键词和主题之间的映射关系。

- help\_topic。帮助主题的内容。

更多信息，请参见第5.1.17节，"服务器端帮助支持"。

时区系统表

这些系统表包含时区信息。

- time\_zone: 时区ID以及它们是否使用闰秒。

- time\_zone\_leap\_second: 闰秒何时发生。

- time\_zone\_name: 时区ID和名称之间的映射。

- time\_zone\_transition, time\_zone\_transition\_type: 时区描述。

欲了解更多信息，请参见第5.1.15节 "MySQL服务器时区支持"。

复制系统表

服务器使用这些系统表来支持复制。

- gtid\_executed。用于存储GTID值的表。参见mysql.gtid\_executed表。

- ndb\_binlog\_index。用于NDB Cluster复制的二进制日志信息。这个表只有在服务器被构建为支持NDBCLUSTER时才会被创建。参见章节23.6.4, "NDB集群复制模式和表"。**- slave\_master\_info, slave\_relay\_log\_info, slave\_worker\_info。用来存储复制服务器上的复制信息。参见第17.2.4节，"中继日志和复制元数据存储库"。**

**刚才列出的所有表都使用InnoDB存储引擎。**

**优化器系统表**

**这些系统表是供优化器使用的。**

**- innodb\_index\_stats, innodb\_table\_stats: 用于InnoDB持久化优化器的统计。参见章节15.8.10.1, "配置持久性优化器的统计参数"。**

**- server\_cost, engine\_cost。优化器成本模型使用的表包含了查询执行过程中发生的操作的成本估算信息。 server\_cost包含了一般服务器操作的优化器成本估算。 engine\_cost包含了特定存储引擎的操作估算。参见第8.9.5节，"优化器成本模型"。**

**杂项系统表**

**其他系统表不符合前面的类别。**

**- audit\_log\_filter, audit\_log\_user。如果安装了MySQL企业审计，这些表提供审计日志过滤器定义和用户账户的持久性存储。参见审计日志表。**

**- firewall\_group\_allowlist, firewall\_groups, firewall\_memebership, firewall\_users, firewall\_whitelist。如果安装了MySQL企业防火墙，这些表为防火墙使用的信息提供持久的存储。参见第6.4.7节，"MySQL企业防火墙"。**

**- 服务器。由FEDERATED存储引擎使用。参见第16.8.2.2节，"使用CREATE SERVER创建一个FEDERATED表"。**

**- innodb\_dynamic\_metadata。由InnoDB存储引擎使用，用于存储快速变化的表元数据，例如自动递增计数器值和索引树损坏标志。替换了驻扎在InnoDB系统表空间中的数据字典缓冲表。**

## 5.4 MySQL服务器日志

5.4.1 选择一般查询日志和慢速查询日志的输出目的地

5.4.2 错误日志

5.4.3 一般查询日志

5.4.4 二进制日志

5.4.5 慢速查询日志

5.4.6 服务器日志维护

MySQL服务器有几个日志，可以帮助你找出正在发生的活动。

| **Log Type** | **Information Written to Log** |
| --- | --- |
| Error log | Problems encountered starting, running, or stopping **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** |
| General query log | Established client connections and statements received from clients |
| Binary log | Statements that change data (also used for replication) |
| Relay log | Data changes received from a replication source server |
| Slow query log | Queries that took more than **[long\_query\_time](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_long_query_time)** seconds to execute |
| DDL log (metadata log) | Metadata operations performed by DDL statements |

默认情况下，除了Windows上的错误日志，没有启用任何日志。(DDL日志总是在需要时创建，没有用户可配置的选项；见DDL日志)。以下有关日志的章节提供了有关启用日志的服务器选项的信息。

默认情况下，服务器会在数据目录中为所有启用的日志写文件。你可以通过冲刷日志来强制服务器关闭和重新打开日志文件（或者在某些情况下切换到一个新的日志文件）。当你发出FLUSH LOGS语句时，会发生日志冲刷；用flush-logs或refresh参数执行mysqladmin；或用-flush-logs或-master-data选项执行mysqldump。参见第13.7.8.3节 "FLUSH语句"，第4.5.2节 "mysqladmin--一个MySQL服务器管理程序"，以及第4.5.4节 "mysqldump--一个数据库备份程序"。此外，当二进制日志的大小达到max\_binlog\_size系统变量的值时，会被刷新。

你可以在运行时控制一般查询和慢速查询日志。你可以启用或禁用日志，或改变日志文件的名称。你可以告诉服务器将一般查询和慢速查询条目写到日志表、日志文件或两者。详情请见第5.4.1节 "选择一般查询日志和慢速查询日志的输出目的地"，第5.4.3节 "一般查询日志"，以及第5.4.5节 "慢速查询日志"。

中继日志只在复制中使用，用于保存复制源服务器的数据变化，这些变化也必须在复制中进行。关于中继日志内容和配置的讨论，请参见第17.2.4.1节，"中继日志"。

关于日志维护操作的信息，如旧的日志文件的过期，见第5.4.6节，"服务器日志维护"。

有关保持日志安全的信息，请参阅第6.1.2.3节 "密码和日志"。

### 5.4.1设置通用查询日志和慢查询日志路径

MySQL Server provides flexible control over the destination of output written to the general query log and the slow query log, if those logs are enabled. Possible destinations for log entries are log files or the **general\_log** and **slow\_log** tables in the **mysql** system database. File output, table output, or both can be selected.

* [Log Control at Server Startup](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#log-destinations-startup)
* [Log Control at Runtime](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#log-destinations-runtime)
* [Log Table Benefits and Characteristics](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#log-destinations-tables)

#### Log Control at Server Startup

The **[log\_output](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_output)** system variable specifies the destination for log output. Setting this variable does not in itself enable the logs; they must be enabled separately.

* If **[log\_output](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_output)** is not specified at startup, the default logging destination is **FILE**.
* If **[log\_output](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_output)** is specified at startup, its value is a list one or more comma-separated words chosen from **TABLE** (log to tables), **FILE** (log to files), or **NONE** (do not log to tables or files). **NONE**, if present, takes precedence over any other specifiers.

The **[general\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log)** system variable controls logging to the general query log for the selected log destinations. If specified at server startup, **[general\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log)** takes an optional argument of 1 or 0 to enable or disable the log. To specify a file name other than the default for file logging, set the **[general\_log\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log_file)** variable. Similarly, the **[slow\_query\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log)** variable controls logging to the slow query log for the selected destinations and setting **[slow\_query\_log\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log_file)** specifies a file name for file logging. If either log is enabled, the server opens the corresponding log file and writes startup messages to it. However, further logging of queries to the file does not occur unless the **FILE** log destination is selected.

Examples:

* To write general query log entries to the log table and the log file, use [--log\_output=TABLE,FILE](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_output) to select both log destinations and [--general\_log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log) to enable the general query log.
* To write general and slow query log entries only to the log tables, use [--log\_output=TABLE](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_output) to select tables as the log destination and [--general\_log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_general_log) and [--slow\_query\_log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log) to enable both logs.
* To write slow query log entries only to the log file, use [--log\_output=FILE](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_output) to select files as the log destination and [--slow\_query\_log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_slow_query_log) to enable the slow query log. In this case, because the default log destination is **FILE**, you could omit the **[log\_output](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_output)** setting.

#### Log Control at Runtime

The system variables associated with log tables and files enable runtime control over logging:

* The **[log\_output](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_output)** variable indicates the current logging destination. It can be modified at runtime to change the destination.
* The **[general\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log)** and **[slow\_query\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log)** variables indicate whether the general query log and slow query log are enabled (**ON**) or disabled (**OFF**). You can set these variables at runtime to control whether the logs are enabled.
* The **[general\_log\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_general_log_file)** and **[slow\_query\_log\_file](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log_file)** variables indicate the names of the general query log and slow query log files. You can set these variables at server startup or at runtime to change the names of the log files.
* To disable or enable general query logging for the current session, set the session **[sql\_log\_off](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_sql_log_off)** variable to **ON** or **OFF**. (This assumes that the general query log itself is enabled.)

#### Log Table Benefits and Characteristics

The use of tables for log output offers the following benefits:

* Log entries have a standard format. To display the current structure of the log tables, use these statements:
* SHOW CREATE TABLE mysql.general\_log;
* SHOW CREATE TABLE mysql.slow\_log;
* Log contents are accessible through SQL statements. This enables the use of queries that select only those log entries that satisfy specific criteria. For example, to select log contents associated with a particular client (which can be useful for identifying problematic queries from that client), it is easier to do this using a log table than a log file.
* Logs are accessible remotely through any client that can connect to the server and issue queries (if the client has the appropriate log table privileges). It is not necessary to log in to the server host and directly access the file system.

The log table implementation has the following characteristics:

* In general, the primary purpose of log tables is to provide an interface for users to observe the runtime execution of the server, not to interfere with its runtime execution.
* [**CREATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#create-table), [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table), and [**DROP TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-table) are valid operations on a log table. For [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) and [**DROP TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-table), the log table cannot be in use and must be disabled, as described later.
* By default, the log tables use the **CSV** storage engine that writes data in comma-separated values format. For users who have access to the .CSV files that contain log table data, the files are easy to import into other programs such as spreadsheets that can process CSV input.

The log tables can be altered to use the **MyISAM** storage engine. You cannot use [**ALTER TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#alter-table) to alter a log table that is in use. The log must be disabled first. No engines other than **CSV** or **MyISAM** are legal for the log tables.

**Log Tables and “Too many open files” Errors.** If you select **TABLE** as a log destination and the log tables use the **CSV** storage engine, you may find that disabling and enabling the general query log or slow query log repeatedly at runtime results in a number of open file descriptors for the .CSV file, possibly resulting in a “Too many open files” error. To work around this issue, execute [**FLUSH TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush) or ensure that the value of **[open\_files\_limit](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_open_files_limit)** is greater than the value of **[table\_open\_cache\_instances](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_table_open_cache_instances)**.

* To disable logging so that you can alter (or drop) a log table, you can use the following strategy. The example uses the general query log; the procedure for the slow query log is similar but uses the **slow\_log** table and **[slow\_query\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_slow_query_log)** system variable.
* SET @old\_log\_state = @@GLOBAL.general\_log;
* SET GLOBAL general\_log = 'OFF';
* ALTER TABLE mysql.general\_log ENGINE = MyISAM;
* SET GLOBAL general\_log = @old\_log\_state;
* [**TRUNCATE TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#truncate-table) is a valid operation on a log table. It can be used to expire log entries.
* [**RENAME TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#rename-table) is a valid operation on a log table. You can atomically rename a log table (to perform log rotation, for example) using the following strategy:
* USE mysql;
* DROP TABLE IF EXISTS general\_log2;
* CREATE TABLE general\_log2 LIKE general\_log;
* RENAME TABLE general\_log TO general\_log\_backup, general\_log2 TO general\_log;
* [**CHECK TABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#check-table) is a valid operation on a log table.
* [**LOCK TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#lock-tables) cannot be used on a log table.
* [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#insert), [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete), and [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) cannot be used on a log table. These operations are permitted only internally to the server itself.
* [**FLUSH TABLES WITH READ LOCK**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-tables-with-read-lock) and the state of the **[read\_only](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_read_only)** system variable have no effect on log tables. The server can always write to the log tables.
* Entries written to the log tables are not written to the binary log and thus are not replicated to replicas.
* To flush the log tables or log files, use [**FLUSH TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-tables) or [**FLUSH LOGS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-logs), respectively.
* Partitioning of log tables is not permitted.
* A **[mysqldump](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqldump" \o "4.5.4 mysqldump — A Database Backup Program)** dump includes statements to recreate those tables so that they are not missing after reloading the dump file. Log table contents are not dumped.

### 5.4.2错误日志

[5.4.2.1 Error Log Configuration](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-configuration)

[5.4.2.2 Default Error Log Destination Configuration](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-destination-configuration)

[5.4.2.3 Error Event Fields](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-event-fields)

[5.4.2.4 Types of Error Log Filtering](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-filtering)

[5.4.2.5 Priority-Based Error Log Filtering (log\_filter\_internal)](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-priority-based-filtering)

[5.4.2.6 Rule-Based Error Log Filtering (log\_filter\_dragnet)](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-rule-based-filtering)

[5.4.2.7 Error Logging in JSON Format](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-json)

[5.4.2.8 Error Logging to the System Log](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-syslog)

[5.4.2.9 Error Log Output Format](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-format)

[5.4.2.10 Error Log File Flushing and Renaming](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-rotation)

This section discusses how to configure the MySQL server for logging of diagnostic messages to the error log. For information about selecting the error message character set and language, see [Section 10.6, “Error Message Character Set”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#charset-errors), and [Section 10.12, “Setting the Error Message Language”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\charset.html#error-message-language).

The error log contains a record of **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** startup and shutdown times. It also contains diagnostic messages such as errors, warnings, and notes that occur during server startup and shutdown, and while the server is running. For example, if **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** notices that a table needs to be automatically checked or repaired, it writes a message to the error log.

Depending on error log configuration, error messages may also populate the Performance Schema **[error\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-error-log-table" \o "27.12.21.1 The error_log Table)** table, to provide an SQL interface to the log and enable its contents to be queried. See [Section 27.12.21.1, “The error\_log Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-error-log-table).

On some operating systems, the error log contains a stack trace if **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** exits abnormally. The trace can be used to determine where **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** exited. See [Section 5.9, “Debugging MySQL”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#debugging-mysql).

If used to start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**, **[mysqld\_safe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld-safe" \o "4.3.2 mysqld_safe — MySQL Server Startup Script)** may write messages to the error log. For example, when **[mysqld\_safe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld-safe" \o "4.3.2 mysqld_safe — MySQL Server Startup Script)** notices abnormal **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** exits, it restarts **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** and writes a **mysqld restarted** message to the error log.

The following sections discuss aspects of configuring error logging.

#### 5.4.2.1 Error Log Configuration

In MySQL 8.0, error logging uses the MySQL component architecture described at [Section 5.5, “MySQL Components”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#components). The error log subsystem consists of components that perform log event filtering and writing, as well as a system variable that configures which components to enable to achieve the desired logging result.

This section discusses how to select components for error logging. For instructions specific to log filters, see [Section 5.4.2.4, “Types of Error Log Filtering”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-filtering). For instructions specific to the JSON and system log sinks, see [Section 5.4.2.7, “Error Logging in JSON Format”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-json), and [Section 5.4.2.8, “Error Logging to the System Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-syslog). For additional details about all available log components, see [Section 5.5.3, “Error Log Components”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-components).

Component-based error logging offers these features:

* Log events can be filtered by filter components to affect the information available for writing.
* Log events are output by sink (writer) components. Multiple sink components can be enabled, to write error log output to multiple destinations.
* Built-in filter and sink components combine to implement the default error log format.
* A loadable sink enables logging in JSON format.
* A loadable sink enables logging to the system log.
* System variables control which log components to enable and how each component operates.

The **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** system variable controls which log components to enable for error logging. The variable may contain a list with 0, 1, or many elements. In the latter case, elements may be delimited by semicolon or (as of MySQL 8.0.12) comma, optionally followed by space. A given setting cannot use both semicolon and comma separators. Component order is significant because the server executes components in the order listed.

By default, **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** has this value:

mysql> **SELECT @@GLOBAL.log\_error\_services;**

+----------------------------------------+

| @@GLOBAL.log\_error\_services |

+----------------------------------------+

| log\_filter\_internal; log\_sink\_internal |

+----------------------------------------+

That value indicates that log events first pass through the **log\_filter\_internal** filter component, then through the **log\_sink\_internal** sink component, both of which are built in. A filter modifies log events seen by components named later in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value. A sink is a destination for log events. Typically, a sink processes log events into log messages that have a particular format and writes these messages to its associated output, such as a file or the system log.

**Note**

The final component in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value cannot be a filter. This is an error because any changes it has on events would have no effect on output:

mysql> **SET GLOBAL log\_error\_services = 'log\_filter\_internal';**

ERROR 1231 (42000): Variable 'log\_error\_services' can't be set to the value

of 'log\_filter\_internal'

To correct the problem, include a sink at the end of the value:

mysql> **SET GLOBAL log\_error\_services = 'log\_filter\_internal; log\_sink\_internal';**

Query OK, 0 rows affected (0.00 sec)

The combination of **log\_filter\_internal** and **log\_sink\_internal** implements the default error log filtering and output behavior. The action of these components is affected by other server options and system variables:

* The output destination is determined by the [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) option (and, on Windows, [--pid-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pid_file) and [--console](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_console)). These determine whether to write error messages to the console or a file and, if to a file, the error log file name. See [Section 5.4.2.2, “Default Error Log Destination Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-destination-configuration).
* The **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** and **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** system variables affect which types of log events **log\_filter\_internal** permits or suppresses. See [Section 5.4.2.5, “Priority-Based Error Log Filtering (log\_filter\_internal)”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-priority-based-filtering).

To change the set of log components used for error logging, load components as necessary, perform any component-specific configuration, and modify the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value. Adding or removing log components is subject to these constraints:

* To add a log component to the list of enabled components:
  + Load the component using [**INSTALL COMPONENT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-component) (unless it is built in or already loaded).
  + If the component exposes any system variables that must be set for component initialization to succeed, assign those variables appropriate values.
  + Enable the component by listing it in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value.
* For a component to be permitted in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value, it must be known. A component is known if it is built in, or if it is loadable and has been loaded using [**INSTALL COMPONENT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-component). Attempts to name an unknown component at server startup cause **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** to be set to its default value. Attempts to name an unknown component at runtime produce an error and the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value remains unchanged.
* To disable a log component, remove it from the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value. Then, if the component is loadable and you also want to unload it, use [**UNINSTALL COMPONENT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#uninstall-component).

Attempts to use [**UNINSTALL COMPONENT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#uninstall-component) to unload a loadable component that is still named in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value produce an error.

For example, to use the system log sink (**log\_sink\_syseventlog**) instead of the default sink (**log\_sink\_internal**), first load the sink component, then modify the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value:

INSTALL COMPONENT 'file://component\_log\_sink\_syseventlog';

SET GLOBAL log\_error\_services = 'log\_filter\_internal; log\_sink\_syseventlog';

**Note**

The URN to use for loading a log component with [**INSTALL COMPONENT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-component) is the component name prefixed with **file://component\_**. For example, for the **log\_sink\_syseventlog** component, the corresponding URN is **file://component\_log\_sink\_syseventlog**.

It is possible to configure multiple log sinks, which enables sending output to multiple destinations. To enable the system log sink in addition to (rather than instead of) the default sink, set the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value like this:

SET GLOBAL log\_error\_services = 'log\_filter\_internal; log\_sink\_internal; log\_sink\_syseventlog';

To revert to using only the default sink and unload the system log sink, execute these statements:

SET GLOBAL log\_error\_services = 'log\_filter\_internal; log\_sink\_internal;

UNINSTALL COMPONENT 'file://component\_log\_sink\_syseventlog';

To configure a log component to be enabled at each server startup, use this procedure:

1. If the component is loadable, load it at runtime using [**INSTALL COMPONENT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-component). Loading the component registers it in the **mysql.component** system table so that the server loads it automatically for subsequent startups.
2. Set the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value at startup to include the component name. Set the value either in the server my.cnf file, or use [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable), which sets the value for the running MySQL instance and also saves the value to be used for subsequent server restarts; see [Section 13.7.6.1, “SET Syntax for Variable Assignment”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable). A value set in my.cnf takes effect at the next restart. A value set using [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) takes effect immediately, and for subsequent restarts.

Suppose that you want to configure, for every server startup, use of the JSON log sink (**log\_sink\_json**) in addition to the built-in log filter and sink (**log\_filter\_internal**, **log\_sink\_internal**). First load the JSON sink if it is not loaded:

INSTALL COMPONENT 'file://component\_log\_sink\_json';

Then set **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** to take effect at server startup. You can set it in my.cnf:

[mysqld]

log\_error\_services='log\_filter\_internal; log\_sink\_internal; log\_sink\_json'

Or you can set it using [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable):

SET PERSIST log\_error\_services = 'log\_filter\_internal; log\_sink\_internal; log\_sink\_json';

The order of components named in **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** is significant, particularly with respect to the relative order of filters and sinks. Consider this **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value:

log\_filter\_internal; log\_sink\_1; log\_sink\_2

In this case, log events pass to the built-in filter, then to the first sink, then to the second sink. Both sinks receive the filtered log events.

Compare that to this **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value:

log\_sink\_1; log\_filter\_internal; log\_sink\_2

In this case, log events pass to the first sink, then to the built-in filter, then to the second sink. The first sink receives unfiltered events. The second sink receives filtered events. You might configure error logging this way if you want one log that contains messages for all log events, and another log that contains messages only for a subset of log events.

**Note**

If the enabled log components include a sink that provides Performance Schema support, events written to the error log are also written to the Performance Schema **[error\_log](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-error-log-table" \o "27.12.21.1 The error_log Table)** table. This enables examining error log contents using SQL queries. Currently, the traditional-format **log\_sink\_internal** and JSON-format **log\_sink\_json** sinks support this capability. See [Section 27.12.21.1, “The error\_log Table”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-error-log-table).

#### 5.4.2.2 Default Error Log Destination Configuration

This section describes which server options configure the default error log destination, which can be the console or a named file. It also indicates which log sink components base their own output destination on the default destination.

In this discussion, “console” means **stderr**, the standard error output. This is your terminal or console window unless the standard error output has been redirected to a different destination.

The server interprets options that determine the default error log destination somewhat differently for Windows and Unix systems. Be sure to configure the destination using the information appropriate to your platform. After the server interprets the default error log destination options, it sets the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** system variable to indicate the default destination, which affects where several log sink components write error messages. The following sections address these topics.

* [Default Error Log Destination on Windows](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-destination-configuration-windows)
* [Default Error Log Destination on Unix and Unix-Like Systems](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-destination-configuration-unix)
* [How the Default Error Log Destination Affects Log Sinks](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-destination-sink-effects)

##### Default Error Log Destination on Windows

On Windows, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** uses the [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error), [--pid-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pid_file), and [--console](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_console) options to determine whether the default error log destination is the console or a file, and, if a file, the file name:

* If [--console](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_console) is given, the default destination is the console. ([--console](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_console) takes precedence over [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) if both are given, and the following items regarding [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) do not apply.)
* If [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) is not given, or is given without naming a file, the default destination is a file named ***host\_name***.err in the data directory, unless the [--pid-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pid_file) option is specified. In that case, the file name is the PID file base name with a suffix of .err in the data directory.
* If [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) is given to name a file, the default destination is that file (with an .err suffix added if the name has no suffix). The file location is under the data directory unless an absolute path name is given to specify a different location.

If the default error log destination is the console, the server sets the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** system variable to **stderr**. Otherwise, the default destination is a file and the server sets **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** to the file name.

##### Default Error Log Destination on Unix and Unix-Like Systems

On Unix and Unix-like systems, **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** uses the [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) option to determine whether the default error log destination is the console or a file, and, if a file, the file name:

* If [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) is not given, the default destination is the console.
* If [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) is given without naming a file, the default destination is a file named ***host\_name***.err in the data directory.
* If [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) is given to name a file, the default destination is that file (with an .err suffix added if the name has no suffix). The file location is under the data directory unless an absolute path name is given to specify a different location.
* If [--log-error](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_log-error) is given in an option file in a **[mysqld]**, **[server]**, or **[mysqld\_safe]** section, on systems that use **[mysqld\_safe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld-safe" \o "4.3.2 mysqld_safe — MySQL Server Startup Script)** to start the server, **[mysqld\_safe](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld-safe" \o "4.3.2 mysqld_safe — MySQL Server Startup Script)** finds and uses the option, and passes it to **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**.

**Note**

It is common for Yum or APT package installations to configure an error log file location under /var/log with an option like **log-error=/var/log/mysqld.log** in a server configuration file. Removing the path name from the option causes the ***host\_name***.err file in the data directory to be used.

If the default error log destination is the console, the server sets the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** system variable to **stderr**. Otherwise, the default destination is a file and the server sets **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** to the file name.

##### How the Default Error Log Destination Affects Log Sinks

After the server interprets the error log destination configuration options, it sets the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** system variable to indicate the default error log destination. Log sink components may base their own output destination on the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** value, or determine their destination independently of **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)**

If **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** is **stderr**, the default error log destination is the console, and log sinks that base their output destination on the default destination also write to the console:

* **log\_sink\_internal**, **log\_sink\_json**, **log\_sink\_test**: These sinks write to the console. This is true even for sinks such as **log\_sink\_json** that can be enabled multiple times; all instances write to the console.
* **log\_sink\_syseventlog**: This sink writes to the system log, regardless of the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** value.

If **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** is not **stderr**, the default error log destination is a file and **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** indicates the file name. Log sinks that base their output destination on the default destination base output file naming on that file name. (A sink might use exactly that name, or it might use some variant thereof.) Suppose that the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** value ***file\_name***. Then log sinks use the name like this:

* **log\_sink\_internal**, **log\_sink\_test**: These sinks write to ***file\_name***.
* **log\_sink\_json**: Successive instances of this sink named in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value write to files named ***file\_name*** plus a numbered .***NN***.json suffix: ***file\_name***.00.json, ***file\_name***.01.json, and so forth.
* **log\_sink\_syseventlog**: This sink writes to the system log, regardless of the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** value.

#### 5.4.2.3 Error Event Fields

Error events intended for the error log contain a set of fields, each of which consists of a key/value pair. An event field may be classified as core, optional, or user-defined:

* A core field is set up automatically for error events. However, its presence in the event during event processing is not guaranteed because a core field, like any type of field, may be unset by a log filter. If this happens, the field cannot be found by subsequent processing within that filter and by components that execute after the filter (such as log sinks).
* An optional field is normally absent but may be present for certain event types. When present, an optional field provides additional event information as appropriate and available.
* A user-defined field is any field with a name that is not already defined as a core or optional field. A user-defined field does not exist until created by a log filter.

As implied by the preceding description, any given field may be absent during event processing, either because it was not present in the first place, or was discarded by a filter. For log sinks, the effect of field absence is sink specific. For example, a sink might omit the field from the log message, indicate that the field is missing, or substitute a default. When in doubt, test: use a filter that unsets the field, then check what the log sink does with it.

The following sections describe the core and optional error event fields. For individual log filter components, there may be additional filter-specific considerations for these fields, or filters may add user-defined fields not listed here. For details, see the documentation for specific filters.

* [Core Error Event Fields](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-event-core-fields)
* [Optional Error Event Fields](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-event-optional-fields)

##### Core Error Event Fields

These error event fields are core fields:

* **time**

The event timestamp, with microsecond precision.

* **msg**

The event message string.

* **prio**

The event priority, to indicate a system, error, warning, or note/information event. This field corresponds to severity in **syslog**. The following table shows the possible priority levels.

| **Event Type** | **Numeric Priority** |
| --- | --- |
| System event | 0 |
| Error event | 1 |
| Warning event | 2 |
| Note/information event | 3 |

The **prio** value is numeric. Related to it, an error event may also include an optional **label** field representing the priority as a string. For example, an event with a **prio** value of 2 may have a **label** value of **'Warning'**.

Filter components may include or drop error events based on priority, except that system events are mandatory and cannot be dropped.

In general, message priorities are determined as follows:

Is the situation or event actionable?

* + Yes: Is the situation or event ignorable?
    - Yes: Priority is warning.
    - No: Priority is error.
  + No: Is the situation or event mandatory?
    - Yes: Priority is system.
    - No: Priority is note/information.
* **err\_code**

The event error code, as a number (for example, **1022**).

* **err\_symbol**

The event error symbol, as a string (for example, [**'ER\_DUP\_KEY'**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_dup_key)).

* **SQL\_state**

The event SQLSTATE value, as a string (for example, **'23000'**).

* **subsystem**

The subsystem in which the event occurred. Possible values are **InnoDB** (the **InnoDB** storage engine), **Repl** (the replication subsystem), **Server** (otherwise).

##### Optional Error Event Fields

Optional error event fields fall into the following categories:

* Additional information about the error, such as the error signaled by the operating system or the error lable:
  + **OS\_errno**

The operating system error number.

* + **OS\_errmsg**

The operating system error message.

* + **label**

The label corresponding to the **prio** value, as a string.

* Identification of the client for which the event occurred:
  + **user**

The client user.

* + **host**

The client host.

* + **thread**

The ID of the thread within **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** responsible for producing the error event. This ID indicates which part of the server produced the event, and is consistent with general query log and slow query log messages, which include the connection thread ID.

* + **query\_id**

The query ID.

* Debugging information:
  + **source\_file**

The source file in which the event occurred, without any leading path.

* + **source\_line**

The line within the source file at which the event occurred.

* + **function**

The function in which the event occurred.

* + **component**

The component or plugin in which the event occurred.

#### 5.4.2.4 Types of Error Log Filtering

Error log configuration normally includes one log filter component and one or more log sink components. For error log filtering, MySQL offers a choice of components:

* **log\_filter\_internal**: This filter component provides error log filtering based on log event priority and error code, in combination with the **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** and **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** system variables. **log\_filter\_internal** is built in and enabled by default. See [Section 5.4.2.5, “Priority-Based Error Log Filtering (log\_filter\_internal)”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-priority-based-filtering).
* **log\_filter\_dragnet**: This filter component provides error log filtering based on user-supplied rules, in combination with the **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)** system variable. See [Section 5.4.2.6, “Rule-Based Error Log Filtering (log\_filter\_dragnet)”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-rule-based-filtering).

#### 5.4.2.5 Priority-Based Error Log Filtering (log\_filter\_internal)

The **log\_filter\_internal** log filter component implements a simple form of log filtering based on error event priority and error code. To affect how **log\_filter\_internal** permits or suppresses error, warning, and information events intended for the error log, set the **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** and **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** system variables.

**log\_filter\_internal** is built in and enabled by default. If this filter is disabled, [**log\_error\_verbosity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_verbosity) and [**log\_error\_suppression\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_log_error_suppression_list) have no effect, so filtering must be performed using another filter service instead where desired (for example, with individual filter rules when using **log\_filter\_dragnet**). For information about filter configuration, see [Section 5.4.2.1, “Error Log Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-configuration).

* [Verbosity Filtering](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-verbosity-filtering)
* [Suppression-List Filtering](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-suppression-filtering)
* [Verbosity and Suppression-List Interaction](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-verbosity-suppression-interaction)

##### Verbosity Filtering

Events intended for the error log have a priority of **ERROR**, **WARNING**, or **INFORMATION**. The **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** system variable controls verbosity based on which priorities to permit for messages written to the log, as shown in the following table.

| **log\_error\_verbosity Value** | **Permitted Message Priorities** |
| --- | --- |
| 1 | **ERROR** |
| 2 | **ERROR**, **WARNING** |
| 3 | **ERROR**, **WARNING**, **INFORMATION** |

If **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** is 2 or greater, the server logs messages about statements that are unsafe for statement-based logging. If the value is 3, the server logs aborted connections and access-denied errors for new connection attempts. See [Section B.3.2.9, “Communication Errors and Aborted Connections”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#communication-errors).

If you use replication, a **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** value of 2 or greater is recommended, to obtain more information about what is happening, such as messages about network failures and reconnections.

If **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** is 2 or greater on a replica, the replica prints messages to the error log to provide information about its status, such as the binary log and relay log coordinates where it starts its job, when it is switching to another relay log, when it reconnects after a disconnect, and so forth.

There is also a message priority of **SYSTEM** that is not subject to verbosity filtering. System messages about non-error situations are printed to the error log regardless of the **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** value. These messages include startup and shutdown messages, and some significant changes to settings.

In the MySQL error log, system messages are labeled as “System”. Other log sinks might or might not follow the same convention, and in the resulting logs, system messages might be assigned the label used for the information priority level, such as “Note” or “Information”. If you apply any additional filtering or redirection for logging based on the labeling of messages, system messages do not override your filter, but are handled by it in the same way as other messages.

##### Suppression-List Filtering

The **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** system variable applies to events intended for the error log and specifies which events to suppress when they occur with a priority of **WARNING** or **INFORMATION**. For example, if a particular type of warning is considered undesirable “noise” in the error log because it occurs frequently but is not of interest, it can be suppressed. **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** does not suppress messages with a priority of **ERROR** or **SYSTEM**.

The **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** value may be the empty string for no suppression, or a list of one or more comma-separated values indicating the error codes to suppress. Error codes may be specified in symbolic or numeric form. A numeric code may be specified with or without the **MY-** prefix. Leading zeros in the numeric part are not significant. Examples of permitted code formats:

ER\_SERVER\_SHUTDOWN\_COMPLETE

MY-000031

000031

MY-31

31

For readability and portability, symbolic values are preferable to numeric values.

Although codes to be suppressed can be expressed in symbolic or numeric form, the numeric value of each code must be in a permitted range:

* 1 to 999: Global error codes that are used by the server as well as by clients.
* 10000 and higher: Server error codes intended to be written to the error log (not sent to clients).

In addition, each error code specified must actually be used by MySQL. Attempts to specify a code not within a permitted range or within a permitted range but not used by MySQL produce an error and the **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** value remains unchanged.

For information about error code ranges and the error symbols and numbers defined within each range, see [Section B.1, “Error Message Sources and Elements”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#error-message-elements), and [MySQL 8.0 Error Message Reference](https://dev.mysql.com/doc/mysql-errors/8.0/en/).

The server can generate messages for a given error code at differing priorities, so suppression of a message associated with an error code listed in **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** depends on its priority. Suppose that the variable has a value of **'ER\_PARSER\_TRACE,MY-010001,10002'**. Then **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** has these effects on messages for those codes:

* Messages generated with a priority of **WARNING** or **INFORMATION** are suppressed.
* Messages generated with a priority of **ERROR** or **SYSTEM** are not suppressed.

##### Verbosity and Suppression-List Interaction

The effect of **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** combines with that of **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)**. Consider a server started with these settings:

[mysqld]

log\_error\_verbosity=2 # error and warning messages only

log\_error\_suppression\_list='ER\_PARSER\_TRACE,MY-010001,10002'

In this case, **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** permits messages with **ERROR** or **WARNING** priority and discards messages with **INFORMATION** priority. Of the nondiscarded messages, **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** discards messages with **WARNING** priority and any of the named error codes.

**Note**

The **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** value of 2 shown in the example is also its default value, so the effect of this variable on **INFORMATION** messages is as just described by default, without an explicit setting. You must set **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** to 3 if you want **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** to affect messages with **INFORMATION** priority.

Consider a server started with this setting:

[mysqld]

log\_error\_verbosity=1 # error messages only

In this case, **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** permits messages with **ERROR** priority and discards messages with **WARNING** or **INFORMATION** priority. Setting **[log\_error\_suppression\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_suppression_list)** has no effect because all error codes it might suppress are already discarded due to the **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** setting.

#### 5.4.2.6 Rule-Based Error Log Filtering (log\_filter\_dragnet)

The **log\_filter\_dragnet** log filter component enables log filtering based on user-defined rules.

To enable the **log\_filter\_dragnet** filter, first load the filter component, then modify the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value. The following example enables **log\_filter\_dragnet** in combination with the built-in log sink:

INSTALL COMPONENT 'file://component\_log\_filter\_dragnet';

SET GLOBAL log\_error\_services = 'log\_filter\_dragnet; log\_sink\_internal';

To set **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** to take effect at server startup, use the instructions at [Section 5.4.2.1, “Error Log Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-configuration). Those instructions apply to other error-logging system variables as well.

With **log\_filter\_dragnet** enabled, define its filter rules by setting the **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)** system variable. A rule set consists of zero or more rules, where each rule is an **IF** statement terminated by a period (**.**) character. If the variable value is empty (zero rules), no filtering occurs.

Example 1. This rule set drops information events, and, for other events, removes the **source\_line** field:

SET GLOBAL dragnet.log\_error\_filter\_rules =

'IF prio>=INFORMATION THEN drop. IF EXISTS source\_line THEN unset source\_line.';

The effect is similar to the filtering performed by the **log\_sink\_internal** filter with a setting of **[log\_error\_verbosity=2](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)**.

For readability, you might find it preferable to list the rules on separate lines. For example:

SET GLOBAL dragnet.log\_error\_filter\_rules = '

IF prio>=INFORMATION THEN drop.

IF EXISTS source\_line THEN unset source\_line.

';

Example 2: This rule limits information events to no more than one per 60 seconds:

SET GLOBAL dragnet.log\_error\_filter\_rules =

'IF prio>=INFORMATION THEN throttle 1/60.';

Once you have the filtering configuration set up as you desire, consider assigning **[dragnet.log\_error\_filter\_rules](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_dragnet.log_error_filter_rules)** using [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) rather than [**SET GLOBAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) to make the setting persist across server restarts. Alternatively, add the setting to the server option file.

To stop using the filtering language, first remove it from the set of error logging components. Usually this means using a different filter component rather than no filter component. For example:

SET GLOBAL log\_error\_services = 'log\_filter\_internal; log\_sink\_internal';

Again, consider using using [**SET PERSIST**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) rather than [**SET GLOBAL**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#set-variable) to make the setting persist across server restarts.

Then uninstall the filter **log\_filter\_dragnet** component:

UNINSTALL COMPONENT 'file://component\_log\_filter\_dragnet';

The following sections describe aspects of **log\_filter\_dragnet** operation in more detail:

* [Grammar for log\_filter\_dragnet Rule Language](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-dragnet-filtering-language)
* [Actions for log\_filter\_dragnet Rules](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-dragnet-filtering-actions)
* [Field References in log\_filter\_dragnet Rules](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-dragnet-filtering-fields)

##### Grammar for log\_filter\_dragnet Rule Language

The following grammar defines the language for **log\_filter\_dragnet** filter rules. Each rule is an **IF** statement terminated by a period (**.**) character. The language is not case-sensitive.

***rule***:

IF ***condition*** THEN ***action***

[ELSEIF ***condition*** THEN ***action***] ...

[ELSE ***action***]

.

***condition***: {

***field*** ***comparator*** ***value***

| [NOT] EXISTS ***field***

| ***condition*** {AND | OR} ***condition***

}

***action***: {

drop

| throttle {***count*** | ***count*** / ***window\_size***}

| set ***field*** [:= | =] ***value***

| unset [***field***]

}

***field***: {

***core\_field***

| ***optional\_field***

| ***user\_defined\_field***

}

***core\_field***: {

time

| msg

| prio

| err\_code

| err\_symbol

| SQL\_state

| subsystem

}

***optional\_field***: {

OS\_errno

| OS\_errmsg

| label

| user

| host

| thread

| query\_id

| source\_file

| source\_line

| function

| component

}

***user\_defined\_field***:

***sequence of characters in [a-zA-Z0-9\_] class***

***comparator***: {== | != | <> | >= | => | <= | =< | < | >}

***value***: {

***string\_literal***

| ***integer\_literal***

| ***float\_literal***

| ***error\_symbol***

| ***priority***

}

***count***: ***integer\_literal***

***window\_size***: ***integer\_literal***

***string\_literal***:

***sequence of characters quoted as '...' or "..."***

***integer\_literal***:

***sequence of characters in [0-9] class***

***float\_literal***:

***integer\_literal***[.***integer\_literal***]

***error\_symbol***:

***valid MySQL error symbol such as ER\_ACCESS\_DENIED\_ERROR or ER\_STARTUP***

***priority***: {

ERROR

| WARNING

| INFORMATION

}

Simple conditions compare a field to a value or test field existence. To construct more complex conditions, use the **AND** and **OR** operators. Both operators have the same precedence and evaluate left to right.

To escape a character within a string, precede it by a backslash (**\**). A backslash is required to include backslash itself or the string-quoting character, optional for other characters.

For convenience, **log\_filter\_dragnet** supports symbolic names for comparisons to certain fields. For readability and portability, symbolic values are preferable (where applicable) to numeric values.

* Event priority values 1, 2, and 3 can be specified as **ERROR**, **WARNING**, and **INFORMATION**. Priority symbols are recognized only in comparisons with the **prio** field. These comparisons are equivalent:
* IF prio == INFORMATION THEN ...
* IF prio == 3 THEN ...
* Error codes can be specified in numeric form or as the corresponding error symbol. For example, [**ER\_STARTUP**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_startup) is the symbolic name for error **1408**, so these comparisons are equivalent:
* IF err\_code == ER\_STARTUP THEN ...
* IF err\_code == 1408 THEN ...

Error symbols are recognized only in comparisons with the **err\_code** field and user-defined fields.

To find the error symbol corresponding to a given error code number, use one of these methods:

* + Check the list of server errors at [Server Error Message Reference](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html).
  + Use the **[perror](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "perror" \o "4.8.2 perror — Display MySQL Error Message Information)** command. Given an error number argument, **[perror](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "perror" \o "4.8.2 perror — Display MySQL Error Message Information)** displays information about the error, including its symbol.

Suppose that a rule set with error numbers looks like this:

IF err\_code == 10927 OR err\_code == 10914 THEN drop.

IF err\_code == 1131 THEN drop.

Using **[perror](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "perror" \o "4.8.2 perror — Display MySQL Error Message Information)**, determine the error symbols:

shell> **perror 10927 10914 1131**

MySQL error code MY-010927 (ER\_ACCESS\_DENIED\_FOR\_USER\_ACCOUNT\_LOCKED):

Access denied for user '%-.48s'@'%-.64s'. Account is locked.

MySQL error code MY-010914 (ER\_ABORTING\_USER\_CONNECTION):

Aborted connection %u to db: '%-.192s' user: '%-.48s' host:

'%-.64s' (%-.64s).

MySQL error code MY-001131 (ER\_PASSWORD\_ANONYMOUS\_USER):

You are using MySQL as an anonymous user and anonymous users

are not allowed to change passwords

Substituting error symbols for numbers, the rule set becomes:

IF err\_code == ER\_ACCESS\_DENIED\_FOR\_USER\_ACCOUNT\_LOCKED

OR err\_code == ER\_ABORTING\_USER\_CONNECTION THEN drop.

IF err\_code == ER\_PASSWORD\_ANONYMOUS\_USER THEN drop.

Symbolic names can be specified as quoted strings for comparison with string fields, but in such cases the names are strings that have no special meaning and **log\_filter\_dragnet** does not resolve them to the corresponding numeric value. Also, typos may go undetected, whereas an error occurs immediately on **SET** for attempts to use an unquoted symbol unknown to the server.

##### Actions for log\_filter\_dragnet Rules

**log\_filter\_dragnet** supports these actions in filter rules:

* **drop**: Drop the current log event (do not log it).
* **throttle**: Apply rate limiting to reduce log verbosity for events matching particular conditions. The argument indicates a rate, in the form ***count*** or ***count***/***window\_size***. The ***count*** value indicates the permitted number of event occurrences to log per time window. The ***window\_size*** value is the time window in seconds; if omitted, the default window is 60 seconds. Both values must be integer literals.

This rule throttles plugin-shutdown messages to 5 occurrences per 60 seconds:

IF err\_code == ER\_PLUGIN\_SHUTTING\_DOWN\_PLUGIN THEN throttle 5.

This rule throttles errors and warnings to 1000 occurrences per hour and information messages to 100 occurrences per hour:

IF prio <= INFORMATION THEN throttle 1000/3600 ELSE throttle 100/3600.

* **set**: Assign a value to a field (and cause the field to exist if it did not already). In subsequent rules, **EXISTS** tests against the field name are true, and the new value can be tested by comparison conditions.
* **unset**: Discard a field. In subsequent rules, **EXISTS** tests against the field name are false, and comparisons of the field against any value are false.

In the special case that the condition refers to exactly one field name, the field name following **unset** is optional and **unset** discards the named field. These rules are equivalent:

IF myfield == 2 THEN unset myfield.

IF myfield == 2 THEN unset.

##### Field References in log\_filter\_dragnet Rules

**log\_filter\_dragnet** rules support references to core, optional, and user-defined fields in error events.

* [Core Field References](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-dragnet-core-field-references)
* [Optional Field References](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-dragnet-optional-field-references)
* [User-Defined Field References](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-dragnet-user-defined-field-references)

###### Core Field References

The **log\_filter\_dragnet** grammar at [Grammar for log\_filter\_dragnet Rule Language](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-dragnet-filtering-language) names the core fields that filter rules recognize. For general descriptions of these fields, see [Section 5.4.2.3, “Error Event Fields”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-event-fields), with which you are assumed to be familiar. The following remarks provide additional information only as it pertains specifically to core field references as used within **log\_filter\_dragnet** rules.

* **prio**

The event priority, to indicate an error, warning, or note/information event. In comparisons, each priority can be specified as a symbolic priority name or an integer literal. Priority symbols are recognized only in comparisons with the **prio** field. These comparisons are equivalent:

IF prio == INFORMATION THEN ...

IF prio == 3 THEN ...

The following table shows the permitted priority levels.

| **Event Type** | **Priority Symbol** | **Numeric Priority** |
| --- | --- | --- |
| **Error event** | **ERROR** | 1 |
| **Warning event** | **WARNING** | 2 |
| **Note/information event** | **INFORMATION** | 3 |

There is also a message priority of **SYSTEM**, but system messages cannot be filtered and are always written to the error log.

Priority values follow the principle that higher priorities have lower values, and vice versa. Priority values begin at 1 for the most severe events (errors) and increase for events with decreasing priority. For example, to discard events with priority lower than warnings, test for priority values higher than **WARNING**:

IF prio > WARNING THEN drop.

The following examples show the **log\_filter\_dragnet** rules to achieve an effect similar to each **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** value permitted by the **log\_filter\_internal** filter:

* + Errors only (**log\_error\_verbosity=1**):
  + IF prio > ERROR THEN drop.
  + Errors and warnings (**log\_error\_verbosity=2**):
  + IF prio > WARNING THEN drop.
  + Errors, warnings, and notes (**log\_error\_verbosity=3**):
  + IF prio > INFORMATION THEN drop.

This rule can actually be omitted because there are no **prio** values greater than **INFORMATION**, so effectively it drops nothing.

* **err\_code**

The numeric event error code. In comparisons, the value to test can be specified as a symbolic error name or an integer literal. Error symbols are recognized only in comparisons with the **err\_code** field and user-defined fields. These comparisons are equivalent:

IF err\_code == ER\_ACCESS\_DENIED\_ERROR THEN ...

IF err\_code == 1045 THEN ...

* **err\_symbol**

The event error symbol, as a string (for example, [**'ER\_DUP\_KEY'**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_dup_key)). **err\_symbol** values are intended more for identifying particular lines in log output than for use in filter rule comparisons because **log\_filter\_dragnet** does not resolve comparison values specified as strings to the equivalent numeric error code. (For that to occur, an error must be specified using its unquoted symbol.)

###### Optional Field References

The **log\_filter\_dragnet** grammar at [Grammar for log\_filter\_dragnet Rule Language](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-dragnet-filtering-language) names the optional fields that filter rules recognize. For general descriptions of these fields, see [Section 5.4.2.3, “Error Event Fields”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-event-fields), with which you are assumed to be familiar. The following remarks provide additional information only as it pertains specifically to optional field references as used within **log\_filter\_dragnet** rules.

* **label**

The label corresponding to the **prio** value, as a string. Filter rules can change the label for log sinks that support custom labels. **label** values are intended more for identifying particular lines in log output than for use in filter rule comparisons because **log\_filter\_dragnet** does not resolve comparison values specified as strings to the equivalent numeric priority.

* **source\_file**

The source file in which the event occurred, without any leading path. For example, to test for the sql/gis/distance.cc file, write the comparison like this:

IF source\_file == "distance.cc" THEN ...

###### User-Defined Field References

Any field name in a **log\_filter\_dragnet** filter rule not recognized as a core or optional field name is taken to refer to a user-defined field.

#### 5.4.2.7 Error Logging in JSON Format

This section describes how to configure error logging using the built-in filter, **log\_filter\_internal**, and the JSON sink, **log\_sink\_json**, to take effect immediately and for subsequent server startups. For general information about configuring error logging, see [Section 5.4.2.1, “Error Log Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-configuration).

To enable the JSON sink, first load the sink component, then modify the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value:

INSTALL COMPONENT 'file://component\_log\_sink\_json';

SET PERSIST log\_error\_services = 'log\_filter\_internal; log\_sink\_json';

To set **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** to take effect at server startup, use the instructions at [Section 5.4.2.1, “Error Log Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-configuration). Those instructions apply to other error-logging system variables as well.

It is permitted to name **log\_sink\_json** multiple times in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value. For example, to write unfiltered events with one instance and filtered events with another instance, you could set **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** like this:

SET PERSIST log\_error\_services = 'log\_sink\_json; log\_filter\_internal; log\_sink\_json';

The JSON sink determines its output destination based on the default error log destination, which is given by the **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** system variable. If **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** names a file, the JSON sink bases output file naming on that file name, plus a numbered .***NN***.json suffix, with ***NN*** starting at 00. For example, if **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** is ***file\_name***, successive instances of **log\_sink\_json** named in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value write to ***file\_name***.00.json, ***file\_name***.01.json, and so forth.

If **[log\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error)** is **stderr**, the JSON sink writes to the console. If **log\_sink\_json** is named multiple times in the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value, they all write to the console, which is likely not useful.

#### 5.4.2.8 Error Logging to the System Log

It is possible to have **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** write the error log to the system log (the Event Log on Windows, and **syslog** on Unix and Unix-like systems).

This section describes how to configure error logging using the built-in filter, **log\_filter\_internal**, and the system log sink, **log\_sink\_syseventlog**, to take effect immediately and for subsequent server startups. For general information about configuring error logging, see [Section 5.4.2.1, “Error Log Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-configuration).

To enable the system log sink, first load the sink component, then modify the **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** value:

INSTALL COMPONENT 'file://component\_log\_sink\_syseventlog';

SET PERSIST log\_error\_services = 'log\_filter\_internal; log\_sink\_syseventlog';

To set **[log\_error\_services](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_services)** to take effect at server startup, use the instructions at [Section 5.4.2.1, “Error Log Configuration”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-configuration). Those instructions apply to other error-logging system variables as well.

**Note**

For MySQL 8.0 configuration, you must enable error logging to the system log explicitly. This differs from MySQL 5.7 and earlier, for which error logging to the system log is enabled by default on Windows, and on all platforms requires no component loading.

Error logging to the system log may require additional system configuration. Consult the system log documentation for your platform.

On Windows, error messages written to the Event Log within the Application log have these characteristics:

* Entries marked as **Error**, **Warning**, and **Note** are written to the Event Log, but not messages such as information statements from individual storage engines.
* Event Log entries have a source of **MySQL** (or **MySQL-*tag*** if **[syseventlog.tag](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_syseventlog.tag)** is defined as ***tag***).

On Unix and Unix-like systems, logging to the system log uses **syslog**. The following system variables affect **syslog** messages:

* [**syseventlog.facility**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.facility): The default facility for **syslog** messages is **daemon**. Set this variable to specify a different facility.
* [**syseventlog.include\_pid**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.include_pid): Whether to include the server process ID in each line of **syslog** output.
* [**syseventlog.tag**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_syseventlog.tag): This variable defines a tag to add to the server identifier (**mysqld**) in **syslog** messages. If defined, the tag is appended to the identifier with a leading hyphen.

**Note**

Prior to MySQL 8.0.13, use the **[log\_syslog\_facility](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog_facility)**, **[log\_syslog\_include\_pid](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog_include_pid)**, and **[log\_syslog\_tag](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_syslog_tag)** system variables rather than the **syseventlog.*xxx*** variables.

MySQL uses the custom label “System” for important system messages about non-error situations, such as startup, shutdown, and some significant changes to settings. In logs that do not support custom labels, including the Event Log on Windows, and **syslog** on Unix and Unix-like systems, system messages are assigned the label used for the information priority level. However, these messages are printed to the log even if the MySQL **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** setting normally excludes messages at the information level.

When a log sink must fall back to a label of “Information” instead of “System” in this way, and the log event is further processed outside of the MySQL server (for example, filtered or forwarded by a **syslog** configuration), these events may by default be processed by the secondary application as being of “Information” priority rather than “System” priority.

#### 5.4.2.9 Error Log Output Format

Each error log sink (writer) component has a characteristic output format it uses to write messages to its destination, but other factors may influence the content of the messages:

* The information available to the log sink. If a log filter component executed prior to execution of the sink component removes a log event field, that field is not available for writing. For information about log filtering, see [Section 5.4.2.4, “Types of Error Log Filtering”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-filtering).
* The information relevant to the log sink. Not every sink writes all fields available in error events.
* System variables may affect log sinks. See [System Variables That Affect Error Log Format](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-format-system-variables).

For names and descriptions of the fields in error events, see [Section 5.4.2.3, “Error Event Fields”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-event-fields). For all log sinks, the thread ID included in error log messages is that of the thread within **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** responsible for writing the message. This ID indicates which part of the server produced the message, and is consistent with general query log and slow query log messages, which include the connection thread ID.

* [log\_sink\_internal Output Format](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-format-output-format-for-log-sink-internal)
* [log\_sink\_json Output Format](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-format-output-format-for-log-sink-json)
* [log\_sink\_syseventlog Output Format](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-format-output-format-for-log-sink-syseventlog)
* [Early-Startup Logging Output Format](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-format-output-format-for-early-logging)
* [System Variables That Affect Error Log Format](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log-format-system-variables)

##### log\_sink\_internal Output Format

The internal log sink produces traditional error log output. For example:

2020-08-06T14:25:02.835618Z 0 [Note] [MY-012487] [InnoDB] DDL log recovery : begin

2020-08-06T14:25:02.936146Z 0 [Warning] [MY-010068] [Server] CA certificate /var/mysql/sslinfo/cacert.pem is self signed.

2020-08-06T14:25:02.963127Z 0 [Note] [MY-010253] [Server] IPv6 is available.

2020-08-06T14:25:03.109022Z 5 [Note] [MY-010051] [Server] Event Scheduler: scheduler thread started with id 5

Traditional-format messages have these fields:

time thread [label] [err\_code] [subsystem] msg

The **[** and **]** square bracket characters are literal characters in the message format. They do not indicate that fields are optional.

The **label** value corresponds to the string form of the **prio** error event priority field.

The **[err\_code]** and **[subsystem]** fields were added in MySQL 8.0. They are missing from logs generated by older servers. Log parsers can treat these fields as parts of the message text that is present only for logs written by servers recent enough to include them. Parsers must treat the **err\_code** part of **[err\_code]** indicators as a string value, not a number, because values such as **MY-012487** and **MY-010051** contain nonnumeric characters.

##### log\_sink\_json Output Format

The JSON-format log sink produces messages as JSON objects that contain key-value pairs. For example:

{

"prio": 3,

"err\_code": 10051,

"source\_line": 561,

"source\_file": "event\_scheduler.cc",

"function": "run",

"msg": "Event Scheduler: scheduler thread started with id 5",

"time": "2020-08-06T14:25:03.109022Z",

"ts": 1596724012005,

"thread": 5,

"err\_symbol": "ER\_SCHEDULER\_STARTED",

"SQL\_state": "HY000",

"subsystem": "Server",

"buffered": 1596723903109022,

"label": "Note"

}

The message shown is reformatted for readability. Events written to the error log appear one message per line.

The **ts** (timestamp) key was added in MySQL 8.0.20 and is unique to the JSON-format log sink. The value is an integer indicating milliseconds since the epoch (**'1970-01-01 00:00:00'** UTC).

The **ts** and **buffered** values are Unix timestamp values and can be converted using **FROM\_UNIXTIME()** and an appropriate divisor:

mysql> **SET time\_zone = '+00:00';**

mysql> **SELECT FROM\_UNIXTIME(1596724012005/1000.0);**

+-------------------------------------+

| FROM\_UNIXTIME(1596724012005/1000.0) |

+-------------------------------------+

| 2020-08-06 14:26:52.0050 |

+-------------------------------------+

mysql> **SELECT FROM\_UNIXTIME(1596723903109022/1000000.0);**

+-------------------------------------------+

| FROM\_UNIXTIME(1596723903109022/1000000.0) |

+-------------------------------------------+

| 2020-08-06 14:25:03.1090 |

+-------------------------------------------+

##### log\_sink\_syseventlog Output Format

The system log sink produces output that conforms to the system log format used on the local platform.

##### Early-Startup Logging Output Format

The server generates some error log messages before startup options have been processed, and thus before it knows error log settings such as the **[log\_error\_verbosity](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_error_verbosity)** and **[log\_timestamps](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_timestamps)** system variable values, and before it knows which log components are to be used. The server handles error log messages that are generated early in the startup process as follows:

* Prior to MySQL 8.0.14, the server generates messages with the default timestamp, format, and verbosity level, and buffers them. After the startup options are processed and the error log configuration is known, the server flushes the buffered messages. Because these early messages use the default log configuration, they may differ from what is specified by the startup options. Also, the early messages are not flushed to log sinks other than the default. For example, logging to the JSON sink does not include these early messages because they are not in JSON format.
* As of MySQL 8.0.14, the server buffers log events rather than formatted log messages. This enables it to retroactively apply configuration settings to those events after the settings are known, with the result that flushed messages use the configured settings, not the defaults. Also, messages are flushed to all configured sinks, not just the default sink.

If a fatal error occurs before log configuration is known and the server must exit, the server formats buffered messages using the logging defaults so they are not lost. If no fatal error occurs but startup is excessively slow prior to processing startup options, the server periodically formats and flushes buffered messages using the logging defaults so as not to appear unresponsive. Although this behavior is similar to pre-8.0.14 behavior in that the defaults are used, it is preferable to losing messages when exceptional conditions occur.

##### System Variables That Affect Error Log Format

The **[log\_timestamps](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_timestamps)** system variable controls the time zone of timestamps in messages written to the error log (as well as to general query log and slow query log files). The server applies **[log\_timestamps](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_timestamps)** to error events before they reach any log sink; it thus affects error message output from all sinks.

Permitted **[log\_timestamps](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_log_timestamps)** values are **UTC** (the default) and **SYSTEM** (the local system time zone). Timestamps are written using ISO 8601 / RFC 3339 format: ***YYYY-MM-DD*T*hh:mm:ss.uuuuuu*** plus a tail value of **Z** signifying Zulu time (UTC) or **±hh:mm** (an offset that indicates the local system time zone adjustment relative to UTC). For example:

2020-08-07T15:02:00.832521Z (UTC)

2020-08-07T10:02:00.832521-05:00 (SYSTEM)

#### 5.4.2.10 Error Log File Flushing and Renaming

If you flush the error log using a [**FLUSH ERROR LOGS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-error-logs) or [**FLUSH LOGS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#flush-logs) statment, or a **[mysqladmin flush-logs](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqladmin" \o "4.5.2 mysqladmin — A MySQL Server Administration Program)** command, the server closes and reopens any error log file to which it is writing. To rename an error log file, do so manually before flushing. Flushing the logs then opens a new file with the original file name. For example, assuming a log file name of ***host\_name***.err, use the following commands to rename the file and create a new one:

mv ***host\_name***.err ***host\_name***.err-old

mysqladmin flush-logs

mv ***host\_name***.err-old ***backup-directory***

On Windows, use **rename** rather than **mv**.

If the location of the error log file is not writable by the server, the log-flushing operation fails to create a new log file. For example, on Linux, the server might write the error log to the /var/log/mysqld.log file, where the /var/log directory is owned by **root** and is not writable by **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**. For information about handling this case, see [Section 5.4.6, “Server Log Maintenance”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#log-file-maintenance).

If the server is not writing to a named error log file, no error log file renaming occurs when the error log is flushed.

### 5.4.3 通用查询日志

一般查询日志是mysqld正在做什么的一般记录。当客户机连接或断开连接时，服务器将信息写入此日志，并记录从客户机收到的每个SQL语句。当你怀疑客户端有错误并想知道客户端向mysqld发送了什么时，一般查询日志可能非常有用。

显示客户端连接时的每一行还包括使用connection\_type来表示用于建立连接的协议。connection\_type是TCP/IP（建立的TCP/IP连接没有SSL）、SSL/TLS（建立的TCP/IP连接有SSL）、Socket（Unix socket文件连接）、Named Pipe（Windows命名管道连接）或Shared Memory（Windows共享内存连接）之一。

mysqld按照接收语句的顺序将其写入查询日志，这可能与语句的执行顺序不同。这种记录顺序与二进制日志的顺序相反，对于二进制日志来说，语句是在执行后但在任何锁被释放前写入的。此外，查询日志可能包含只选择数据的语句，而这样的语句永远不会写到二进制日志中。

当在复制源服务器上使用基于语句的二进制日志时，其副本收到的语句被写到每个副本的查询日志中。如果客户端用mysqlbinlog工具读取事件并将其传递给服务器，则语句会被写入源的查询日志。

然而，当使用基于行的二进制日志时，更新作为行变化而不是SQL语句被发送，因此当binlog\_format为ROW时，这些语句永远不会被写入查询日志。当这个变量被设置为MIXED时，一个给定的更新也可能不会被写到查询日志中，这取决于所使用的语句。更多信息请参见章节17.2.1.1, "基于语句的复制和基于行的复制的优缺点"。

默认情况下，一般查询日志是禁用的。要明确指定初始通用查询日志状态，请使用 --general\_log[={0|1}]。如果没有参数或者参数为1，--general\_log会启用日志。如果参数为0，该选项将禁用该日志。要指定一个日志文件名，使用 --general\_log\_file=file\_name。要指定日志目的地，请使用log\_output系统变量（如第5.4.1节 "选择一般查询日志和慢速查询日志输出目的地 "中所述）。

注意

如果你指定了TABLE日志目的地，请参阅日志表和 "太多开放文件 "错误。

如果你没有为一般查询日志文件指定名称，默认名称是host\_name.log。服务器会在数据目录下创建该文件，除非给出一个绝对路径名来指定不同的目录。

要想在运行时禁用或启用总查询日志或改变日志文件的名称，可以使用全局 general\_log 和 general\_log\_file 系统变量。将general\_log设置为0（或OFF）以禁用该日志，或设置为1（或ON）以启用该日志。设置 general\_log\_file 来指定日志文件的名称。如果一个日志文件已经打开，它将被关闭，新的文件被打开。

当通用查询日志被启用时，服务器会将输出写入log\_output系统变量所指定的任何目的地。如果你启用了该日志，服务器会打开日志文件并向其写入启动信息。然而，除非选择了FILE日志目标，否则不会发生进一步的查询日志记录。如果目的地是NONE，即使启用了一般的日志，服务器也不写查询。如果日志目标值不包含FILE，设置日志文件名对日志记录没有影响。

服务器重启和日志刷新不会导致生成一个新的通用查询日志文件（尽管刷新会关闭并重新打开它）。要重命名该文件并创建一个新的文件，请使用以下命令。

shell> mv host\_name.log host\_name-old.log

shell> mysqladmin flush-logs

shell> mv host\_name-old.log backup-directory

在 Windows 上，使用 rename 而不是 mv。

你也可以在运行时通过禁用日志来重命名一般查询日志文件。

SET GLOBAL general\_log = 'OFF';

在禁用日志的情况下，从外部重命名日志文件（例如，从命令行）。然后再次启用该日志。

SET GLOBAL GENERAL\_LOG = 'ON';

这个方法可以在任何平台上使用，不需要重新启动服务器。

要禁用或启用当前会话的一般查询日志，请将session sql\_log\_off变量设置为ON或OFF。(这假定一般查询日志本身是启用的)。

写入一般查询日志的语句中的密码会被服务器重写，不会以纯文本的形式出现。通过使用 --log-raw 选项启动服务器，可以抑制对一般查询日志的密码重写。这个选项对于诊断来说可能很有用，可以看到服务器收到的语句的确切文本，但是出于安全原因，不建议在生产中使用。参见第6.1.2.3节，"密码和日志"。

密码重写的一个含义是，不能被解析的语句（例如，由于语法错误）不会被写入一般的查询日志，因为它们不能被知道是无密码的。需要记录所有语句（包括有错误的语句）的用例应该使用--log-raw选项，记住这也绕过了密码重写。

密码重写只发生在期望有纯文本密码的情况下。对于语法上期望有密码哈希值的语句，不会发生重写。如果在这样的语法中错误地提供了纯文本密码，那么密码将被记录下来，不进行重写。

log\_timestamps系统变量控制写入一般查询日志文件（以及慢速查询日志文件和错误日志）的消息中时间戳的时区。它不影响写到日志表中的一般查询日志和慢速查询日志信息的时区，但是从这些表中检索的行可以用CONVERT\_TZ()或通过设置会话时间区系统变量从本地系统时区转换到任何需要的时区。

### 5.4.4  Binary Log

5.4.4.1 二进制日志格式

5.4.4.2 设置二进制日志格式

5.4.4.3 混合二进制日志格式

5.4.4.4 对mysql数据库表的修改的日志格式

5.4.4.5 二进制日志事务压缩

二进制日志包含描述数据库变化的 "事件"，如表的创建操作或表数据的变化。它还包含有可能产生变化的语句的事件（例如，没有匹配行的DELETE），除非使用基于行的日志。二进制日志还包含关于每个更新数据的语句所花时间的信息。二进制日志有两个重要的目的。

- 对于复制来说，复制源服务器上的二进制日志提供了一个将被发送到副本的数据变化记录。源服务器将其二进制日志中包含的信息发送给它的复制体，复制体复制这些事务，做出与源服务器上相同的数据改变。参见第17.2节，"复制实现"。

- 某些数据恢复操作需要使用二进制日志。在备份被恢复后，二进制日志中记录的备份后的事件被重新执行。这些事件使数据库从备份点更新到最新。见第7.5节，"时间点（增量）恢复"。

二进制日志不用于诸如SELECT或SHOW等不修改数据的语句。要记录所有的语句（例如，要识别一个有问题的查询），请使用一般的查询日志。参见章节5.4.3, "一般查询日志"。

在启用二进制日志的情况下运行服务器，会使性能稍微慢一些。然而，二进制日志在使你设置复制和恢复操作方面的好处通常超过了这种轻微的性能下降。

二进制日志对意外的停止是有弹性的。只有完整的事件或事务被记录或读回。

写入二进制日志的语句中的密码会被服务器重写，不会以纯文本的形式出现。另见第6.1.2.3节，"密码和日志"。

从MySQL 8.0.14开始，二进制日志文件和中继日志文件可以被加密，有助于保护这些文件和其中包含的潜在敏感数据不被外部攻击者滥用，也不被存储它们的操作系统的用户未经授权查看。你可以通过将binlog\_encryption系统变量设置为ON来启用MySQL服务器上的加密功能。更多信息，见第17.3.2节 "加密二进制日志文件和中继日志文件"。

下面的讨论描述了一些影响二进制日志操作的服务器选项和变量。完整的清单请参见第17.1.6.4节 "二进制日志选项和变量"。

默认情况下，二进制日志是启用的（log\_bin系统变量被设置为ON）。例外情况是如果你使用mysqld通过调用--initialize或--initialize-insecure选项来手动初始化数据目录，此时二进制日志记录默认是禁用的，但可以通过指定--log-bin选项来启用。

要禁用二进制日志记录，你可以在启动时指定--skip-log-bin或--disable-log-bin选项。如果指定了这两个选项中的任何一个，并且还指定了--log-bin，那么后面指定的选项将优先使用。

--log-slave-updates 和 --slave-preserve-commit-order 选项需要二进制日志记录。如果你禁用二进制日志，要么省略这些选项，要么指定--log-slave-updates=OFF和--skip-slave-preserve-commit-order。当指定--skip-log-bin或--disable-log-bin时，MySQL默认会禁用这些选项。如果你将--log-slave-updates或--slave-preserve-commit-order与--skip-log-bin或--disable-log-bin同时指定，会发出警告或错误信息。

--log-bin[=base\_name]选项用于指定二进制日志文件的基本名称。如果你不提供-log-bin选项，MySQL使用binlog作为二进制日志文件的默认基本名称。为了与早期版本兼容，如果你在提供--log-bin选项时没有提供字符串或提供一个空字符串，则基名默认为host\_name-bin，使用主机的名称。建议你指定一个基本名称，这样如果主机名称改变了，你可以很容易地继续使用相同的二进制日志文件名称（见B.3.7节，"MySQL中已知的问题"）。如果你在日志名称中提供了扩展名(例如，--log-bin=base\_name.extension)，扩展名会被默默地删除和忽略。

mysqld将一个数字扩展名附加到二进制日志基名上，以生成二进制日志文件名。每当服务器创建一个新的日志文件时，该数字就会增加，从而创建一个有序的文件系列。每次发生以下任何事件时，服务器都会在该系列中创建一个新的文件。

- 服务器被启动或重新启动

- 服务器刷新了日志。

- 当前日志文件的大小达到max\_binlog\_size。

如果你使用大型事务，二进制日志文件可能会变得比max\_binlog\_size大，因为一个事务是一次性写入文件的，绝不会在文件之间分割。

为了跟踪哪些二进制日志文件已经被使用，mysqld还创建了一个二进制日志索引文件，其中包含二进制日志文件的名称。默认情况下，它的基本名称与二进制日志文件相同，扩展名为'.index'。你可以用--log-bin-index[=file\_name]选项来改变二进制日志索引文件的名称。当mysqld运行时，你不应该手动编辑这个文件；这样做会使mysqld混淆。

术语 "二进制日志文件 "通常表示一个包含数据库事件的单独的编号文件。术语 "二进制日志 "统称为一组编号的二进制日志文件加上索引文件。

二进制日志文件和二进制日志索引文件的默认位置是数据目录。你可以使用-log-bin选项来指定一个替代位置，方法是在基本名称中加入一个领先的绝对路径名称来指定一个不同的目录。当服务器从二进制日志索引文件中读取一个条目时，它会检查该条目是否包含一个相对路径，该索引文件跟踪已使用的二进制日志文件。如果有，路径的相对部分将被替换为使用-log-bin选项设置的绝对路径。记录在二进制日志索引文件中的绝对路径保持不变；在这种情况下，必须手动编辑索引文件，以使新的路径或路径被使用。二进制日志文件的基本名称和任何指定的路径都可以作为log\_bin\_basename系统变量。

在MySQL 5.7中，当二进制日志被启用时，必须指定一个服务器ID，否则服务器将无法启动。在MySQL 8.0中，server\_id系统变量默认被设置为1。当启用二进制日志时，可以用这个默认ID启动服务器，但如果你不使用server\_id系统变量明确指定一个服务器ID，就会发出一条信息消息。对于在复制拓扑中使用的服务器，你必须为每个服务器指定一个唯一的非零的服务器ID。

一个拥有足够权限设置限制性会话系统变量的客户（参见章节5.1.9.1, "系统变量权限"）可以通过使用SET sql\_log\_bin=OFF语句来禁止对自己的语句进行二进制记录。

默认情况下，服务器会记录事件的长度以及事件本身，并使用它来验证事件是否被正确写入。你也可以通过设置binlog\_checksum系统变量使服务器为事件写入校验和。当从二进制日志中读回时，源文件默认使用事件长度，但如果有的话，可以通过启用master\_verify\_checksum系统变量使其使用校验和。副本上的复制I/O线程也会验证从源头收到的事件。你可以通过启用slave\_sql\_verify\_checksum系统变量，使复制的SQL线程在从中继日志读取时使用校验和（如果有的话）。

记录在二进制日志中的事件的格式取决于二进制日志格式。支持三种格式类型：基于行的日志记录、基于语句的日志记录和混合基的日志记录。使用的二进制日志格式取决于MySQL版本。关于日志格式的一般描述，见第5.4.4.1节，"二进制日志格式"。关于二进制日志格式的详细信息，见MySQL内部。二进制日志。

服务器评估-binlog-do-db和-binlog-ignore-db选项的方式与评估--replicate-do-db和--replicate-ignore-db选项的方式相同。关于如何做到这一点的信息，请参阅第17.2.5.1节，"数据库级复制和二进制日志选项的评估"。

复制在启动时默认启用了log\_slave\_updates系统变量，这意味着复制会将从源头收到的任何数据修改写到自己的二进制日志。二进制日志必须被启用才能发挥作用（参见第17.1.6.3节，"复制服务器选项和变量"）。这个设置使复制体能够作为其他复制体的源。

你可以用RESET MASTER语句删除所有二进制日志文件，或者用PURGE BINARY LOGS删除其中的一个子集。参见第13.7.8.6节 "RESET语句 "和第13.4.1.1节 "PURGE BINARY LOGS语句"。

如果你正在使用复制，你不应该删除源上的旧二进制日志文件，直到你确定没有副本还需要使用它们。例如，如果你的复制从未落后超过三天，每天一次你可以在源上执行mysqladmin flush-logs，然后删除任何超过三天的日志。你可以手动删除这些文件，但最好是使用PURGE BINARY LOGS，它也可以为你安全地更新二进制日志索引文件（并且可以接受一个日期参数）。参见第13.4.1.1节，"PURGE BINARY LOGS语句"。

你可以用mysqlbinlog工具显示二进制日志文件的内容。当你想为恢复操作重新处理日志中的语句时，这可能很有用。例如，你可以从二进制日志中更新一个MySQL服务器，如下所示。

shell> **mysqlbinlog *log\_file* | mysql -h *server\_name***

mysqlbinlog也可以用来显示副本上的中继日志文件的内容，因为它们是使用与二进制日志文件相同的格式写入的。关于mysqlbinlog工具的更多信息以及如何使用它，见第4.6.9节 "mysqlbinlog-处理二进制日志文件的工具"。关于二进制日志和恢复操作的更多信息，见第7.5节，"时间点（增量）恢复"。

二进制日志是在语句或事务完成后，但在任何锁被释放或任何提交被完成之前立即进行。这确保了日志是按照提交顺序记录的。

对非交易表的更新在执行后立即存储在二进制日志中。

在一个未提交的事务中，所有改变事务表（如InnoDB表）的更新（UPDATE、DELETE或INSERT）被缓存，直到服务器收到COMMIT语句。在这一点上，mysqld在执行COMMIT之前将整个事务写入二进制日志。

对非事务性表的修改不能回滚。如果一个被回滚的事务包括对非交易表的修改，整个事务被记录在ROLLBACK语句的最后，以确保对这些表的修改被复制。

当一个处理事务的线程开始时，它分配一个binlog\_cache\_size的缓冲区来缓冲语句。如果一个语句大于这个大小，线程就会打开一个临时文件来存储该事务。当线程结束时，该临时文件被删除。从MySQL 8.0.17开始，如果二进制日志加密在服务器上被激活，临时文件将被加密。

Binlog\_cache\_use状态变量显示使用该缓冲区（可能还有临时文件）存储语句的事务数量。Binlog\_cache\_disk\_use状态变量显示了其中有多少事务实际上不得不使用临时文件。这两个变量可以用来调整binlog\_cache\_size到一个足够大的值，避免使用临时文件。

max\_binlog\_cache\_size系统变量（默认为4GB，这也是最大值）可以用来限制用于缓存一个多语句事务的总大小。如果一个事务大于这个字节数，它就会失败并回滚。最小值是4096。

如果你使用二进制日志和基于行的日志，并发插入将被转换为普通插入，用于CREATE ... SELECT或INSERT ... SELECT语句的并发插入。这样做是为了确保你可以通过在备份操作中应用日志来重新创建一个精确的表的副本。如果你使用的是基于语句的日志记录，那么原始的语句会被写入日志中。

二进制日志格式有一些已知的限制，会影响到从备份中恢复。参见第17.5.1节，"复制功能和问题"。

存储程序的二进制日志是按照第25.7节 "存储程序二进制日志 "中的描述进行的。

请注意，由于复制的增强，MySQL 8.0中的二进制日志格式与以前版本的MySQL不同。见第17.5.2节，"MySQL版本之间的复制兼容性"。

如果服务器无法写入二进制日志、刷新二进制日志文件或将二进制日志同步到磁盘，复制源服务器上的二进制日志可能变得不一致，复制可能失去与源的同步性。binlog\_error\_action系统变量控制在二进制日志遇到这种类型的错误时所采取的行动。

- 默认设置，ABORT\_SERVER，使服务器停止二进制日志记录并关闭。在这一点上，你可以识别并纠正错误的原因。在重新启动时，恢复工作与服务器意外停止的情况一样进行（参见第17.4.2节，"处理副本的意外停止"）。

- IGNORE\_ERROR设置提供了与旧版本MySQL的向后兼容性。有了这个设置，服务器继续进行正在进行的交易并记录错误，然后停止二进制记录，但继续执行更新。在这一点上，你可以确定并纠正错误的原因。要恢复二进制日志记录，必须再次启用log\_bin，这需要重新启动服务器。只有在你需要向后兼容，并且二进制日志在这个MySQL服务器实例上是非必要的情况下才使用这个选项。例如，你可能只将二进制日志用于服务器的间歇性审计或调试，而不将其用于服务器的复制或依赖它进行时间点恢复操作。

默认情况下，二进制日志在每次写入时都会同步到磁盘（sync\_binlog=1）。如果没有启用sync\_binlog，而操作系统或机器（不仅是MySQL服务器）崩溃了，有可能会丢失二进制日志的最后几条语句。为了防止这种情况，请启用sync\_binlog系统变量，在每N个提交组之后将二进制日志同步到磁盘。参见第5.1.8节，"服务器系统变量"。sync\_binlog的最安全值是1（默认值），但这也是最慢的。

在早期的MySQL版本中，如果发生崩溃，即使sync\_binlog设置为1，也有可能出现表内容和二进制日志内容不一致的情况。例如，如果你使用InnoDB表，并且MySQL服务器处理一个COMMIT语句，它将许多准备好的事务依次写入二进制日志，同步二进制日志，然后将事务提交到InnoDB。如果服务器在这两个操作之间意外退出，事务会在重新启动时被InnoDB回滚，但仍然存在于二进制日志中。这样的问题在以前的版本中通过启用InnoDB对XA事务的两阶段提交的支持来解决。在8.0.0和更高版本中，InnoDB对XA事务中两阶段提交的支持总是被启用。

InnoDB对XA事务中两阶段提交的支持确保二进制日志和InnoDB数据文件是同步的。然而，MySQL服务器也应该被配置为在提交事务之前将二进制日志和InnoDB日志同步到磁盘。InnoDB日志默认是同步的，sync\_binlog=1确保二进制日志是同步的。隐式InnoDB支持XA事务中的两阶段提交和sync\_binlog=1的效果是，在崩溃后重新启动时，在做完事务回滚后，MySQL服务器扫描最新的二进制日志文件以收集事务xid值并计算出二进制日志文件中最后的有效位置。然后，MySQL服务器告诉InnoDB完成任何成功写入二进制日志的准备好的事务，并将二进制日志截断到最后的有效位置。这确保了二进制日志反映了InnoDB表的准确数据，因此副本与源保持同步，因为它没有收到已经回滚的语句。

如果MySQL服务器在崩溃恢复时发现二进制日志比它应该有的短，它至少缺少一个成功提交的InnoDB事务。如果sync\_binlog=1，并且磁盘/文件系统在被要求时做实际的同步（有些不做），这种情况就不应该发生，所以服务器会打印出错误信息 The binary log file\_name is shorter than its expected size. 在这种情况下，这个二进制日志是不正确的，复制应该从源的数据的新快照重新开始。

以下系统变量的会话值被写入二进制日志，并在解析二进制日志时被复制体所认可。

- sql\_mode（除了NO\_DIR\_IN\_CREATE模式不被复制，见17.5.1.39节 "复制和变量"）。

- 外键检查

- 唯一性检查

- 字符集客户端

- 连接校对

- 校对数据库

- 校对服务器

- sql\_auto\_is\_null

#### 5.4.4.1 Binary Logging Formats

服务器使用几种日志格式来记录二进制日志中的信息。

- MySQL中的复制功能最初是基于从源到副本的SQL语句的传播。这被称为基于语句的日志记录。你可以通过用-binlog-format=STATEMENT启动服务器来导致使用这种格式。

- 在基于行的日志记录中（默认情况），源文件将事件写入二进制日志，表明单个表的行是如何被影响的。你可以通过使用-binlog-format=ROW来使服务器使用基于行的日志记录。

- 第三个选项也是可用的：混合日志记录。在混合日志中，默认使用基于语句的日志，但在某些情况下，日志模式会自动切换到基于行的，如下所述。你可以通过用选项-binlog-format=MIXED启动mysqld，使MySQL明确地使用混合日志记录。

日志格式也可以由正在使用的存储引擎设置或限制。这有助于消除在使用不同存储引擎的源和副本之间复制某些语句的问题。

在基于语句的复制中，可能会出现复制非确定性语句的问题。在决定一个给定的语句对于基于语句的复制是否安全时，MySQL确定它是否可以保证该语句可以使用基于语句的日志进行复制。如果MySQL不能做出这种保证，它就会将该语句标记为潜在的不可靠，并发出警告：Statement may not be safe to log in statement format。

你可以通过使用MySQL的基于行的复制来避免这些问题。

#### 5.4.4.2 Setting The Binary Log Format

你可以通过用-binlog-format=type启动MySQL服务器来明确选择二进制日志格式。类型的支持值是。

- STATEMENT导致日志记录是基于语句的。

- ROW导致日志是基于行的。这是默认的。

- MIXED导致日志记录使用混合格式。

设置二进制日志格式并不激活服务器的二进制日志。该设置只有在服务器上启用了二进制日志时才会生效，当log\_bin系统变量被设置为ON时就是这种情况。从MySQL 8.0开始，二进制日志是默认启用的，只有在启动时指定--skip-log-bin或--disable-log-bin选项时才会禁用。

日志格式也可以在运行时切换，不过要注意，在一些情况下不能这样做，本节后面会讨论。设置binlog\_format系统变量的全局值，为改变后连接的客户端指定格式。

mysql> **SET GLOBAL binlog\_format = 'STATEMENT';**

mysql> **SET GLOBAL binlog\_format = 'ROW';**

mysql> **SET GLOBAL binlog\_format = 'MIXED';**

An individual client can control the logging format for its own statements by setting the session value of **[binlog\_format](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_binlog_format)**:

mysql> **SET SESSION binlog\_format = 'STATEMENT';**

mysql> **SET SESSION binlog\_format = 'ROW';**

mysql> **SET SESSION binlog\_format = 'MIXED';**

改变全局binlog\_format值需要足够的权限来设置全局系统变量。改变会话binlog\_format值需要足够的权限来设置限制性会话系统变量。见第5.1.9.1节，"系统变量的权限"。

客户可能想在每个会话的基础上设置二进制日志，这有几个原因。

- 对数据库进行许多小改动的会话可能希望使用基于行的日志记录。

- 一个执行与WHERE子句中许多行相匹配的更新的会话可能想使用基于语句的日志记录，因为记录一些语句比记录许多行更有效。

- 有些语句在源上需要大量的执行时间，但只导致几条行被修改。因此，使用基于行的日志记录来复制它们可能是有益的。

当你不能在运行时切换复制格式时，也有例外。

- 复制格式不能从存储函数或触发器中改变。

- 如果NDB存储引擎被启用。

- 如果一个会话有开放的临时表，则不能为该会话改变复制格式（SET @@SESSION.binlog\_format）。

- 如果任何复制通道有开放的临时表，复制格式不能在全局范围内改变（SET @@GLOBAL.binlog\_format或SET @@PERSIST.binlog\_format）。

- 如果任何复制通道应用者线程当前正在运行，复制格式不能被全局改变（SET @@GLOBAL.binlog\_format 或 SET @@PERSIST.binlog\_format）。

在这些情况下试图切换复制格式（或试图设置当前的复制格式），都会导致错误。然而，你可以使用PERSIST\_ONLY（SET @@PERSIST\_ONLY.binlog\_format）来随时改变复制格式，因为这个动作不会修改运行时的全局系统变量值，而且只在服务器重启后生效。

当存在任何临时表时，不建议在运行时切换复制格式，因为临时表只在使用基于语句的复制时被记录，而在基于行的复制和混合复制时，它们不会被记录。

在复制进行时切换复制格式也会导致问题。每台MySQL服务器都可以设置它自己的且仅是它自己的二进制日志格式（无论binlog\_format是用全局范围还是会话范围设置的，都是真实的）。这意味着改变复制源服务器上的日志格式不会导致副本改变其日志格式来匹配。当使用STATEMENT模式时，binlog\_format系统变量不会被复制。当使用MIXED或ROW日志模式时，它被复制但被复制体忽略。

一个副本不能将收到的ROW日志格式的二进制日志条目转换为STATEMENT格式，以用于它自己的二进制日志。因此，如果源文件使用ROW或MIXED格式，副本必须使用。在复制过程中，将源的二进制日志格式从STATEMENT改为ROW或MIXED，而复制又是在STATEMENT格式的副本中进行的，会导致复制失败，出现诸如执行行事件错误。不能执行语句：无法写入二进制日志，因为语句是行格式，而BINLOG\_FORMAT = STATEMENT。为了安全地改变格式，你必须停止复制，并确保在源和副本上都做同样的改变。

如果你使用InnoDB表，并且事务隔离级别是READ COMMITTED或READ UNCOMMITTED，那么只能使用基于行的日志记录。可以将日志格式改为STATEMENT，但是在运行时这样做会很快导致错误，因为InnoDB不能再执行插入。

在二进制日志格式设置为ROW的情况下，许多变化是使用基于行的格式写入二进制日志的。然而，有些变化仍然使用基于语句的格式。例子包括所有的DDL（数据定义语言）语句，如CREATE TABLE、ALTER TABLE或DROP TABLE。

当使用基于行的二进制日志时，binlog\_row\_event\_max\_size系统变量和其对应的启动选项-binlog-row-event-max-size对行事件的最大尺寸设置了一个软限制。默认值是8192字节，而且这个值只能在服务器启动时改变。在可能的情况下，存储在二进制日志中的行被分组为事件，其大小不超过此设置的值。如果一个事件不能被分割，则可能超过最大尺寸。

--binlog-row-event-max-size选项适用于能够进行基于行的复制的服务器。行被存储到二进制日志中，其大小以字节为单位，不超过该选项的值。该值必须是256的倍数。默认值是8192。

警告

当使用基于语句的记录进行复制时，如果语句的设计方式使数据的修改是不确定的，即由查询优化器决定，那么源站点和复制站点的数据可能会变得不同。一般来说，即使在复制之外，这也不是一个好的做法。关于这个问题的详细解释，见B.3.7节 "MySQL中已知的问题"。

#### 5.4.4.3 Mixed Binary Logging Format

当以MIXED日志格式运行时，在以下条件下，服务器自动从基于语句的日志切换到基于行的日志。

- 当一个函数包含UUID()时。

- 当一个或多个带有AUTO\_INCREMENT列的表被更新并且触发器或存储函数被调用时。像所有其他不安全的语句一样，如果binlog\_format = STATEMENT，这会产生一个警告。

更多信息请参见章节17.5.1.1, "复制和AUTO\_INCREMENT"。

- 当视图的主体需要基于行的复制时，创建视图的语句也会使用它。例如，当创建视图的语句使用UUID()函数时就会出现这种情况。

- 当涉及到对可加载函数的调用时。

- 当使用FOUND\_ROWS()或ROW\_COUNT()时。(Bug #12092, Bug #30244)

- 当使用USER()、CURRENT\_USER()或CURRENT\_USER时。(BUG #28086)

- 当涉及的一个表是mysql数据库中的一个日志表时。

- 当使用LOAD\_FILE()函数时。(BUG #39701)

- 当一个语句引用一个或多个系统变量时。(Bug #31168)

异常情况。 下列系统变量在使用会话范围时（仅），不会导致日志格式的切换。

* + [**auto\_increment\_increment**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_auto_increment_increment)
  + [**auto\_increment\_offset**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_auto_increment_offset)
  + [**character\_set\_client**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_client)
  + [**character\_set\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_connection)
  + [**character\_set\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_database)
  + [**character\_set\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_character_set_server)
  + [**collation\_connection**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_connection)
  + [**collation\_database**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_database)
  + [**collation\_server**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_collation_server)
  + [**foreign\_key\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_foreign_key_checks)
  + [**identity**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_identity)
  + [**last\_insert\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_last_insert_id)
  + [**lc\_time\_names**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lc_time_names)
  + [**pseudo\_thread\_id**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_pseudo_thread_id)
  + [**sql\_auto\_is\_null**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_sql_auto_is_null)
  + [**time\_zone**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_time_zone)
  + [**timestamp**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_timestamp)
  + [**unique\_checks**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_unique_checks)

关于确定系统变量范围的信息，参见章节5.1.9, "使用系统变量"。

关于复制如何处理sql\_mode的信息，参见章节17.5.1.39, "复制和变量"。

在早期版本中，当使用混合二进制日志格式时，如果一个语句是按行记录的，而执行该语句的会话有任何临时表，那么所有后续的语句都被视为不安全的，并以基于行的格式记录，直到该会话使用的所有临时表被丢弃。从MySQL 8.0开始，对临时表的操作不以混合二进制日志格式记录，并且会话中临时表的存在对每个语句使用的日志模式没有影响。

注意

如果你试图使用基于语句的日志来执行一个应该使用基于行的日志来写的语句，会产生一个警告。该警告同时显示在客户端（在SHOW WARNINGS的输出中）和通过mysqld错误日志。每次执行这样的语句时，都有一个警告被添加到SHOW WARNINGS表中。然而，只有为每个客户会话产生警告的第一个语句被写入错误日志，以防止淹没日志。

除了上面的决定外，各个引擎还可以决定当表内信息被更新时使用的日志格式。单个引擎的日志功能可以被定义如下。

- 如果一个引擎支持基于行的日志记录，那么这个引擎就被称为具有行日志记录能力。

- 如果一个引擎支持基于语句的日志记录，那么这个引擎被称为具有语句日志记录能力。

一个特定的存储引擎可以支持任何一种或两种日志格式。下表列出了每个引擎所支持的格式。

| **Storage Engine** | **Row Logging Supported** | **Statement Logging Supported** |
| --- | --- | --- |
| **ARCHIVE** | Yes | Yes |
| **BLACKHOLE** | Yes | Yes |
| **CSV** | Yes | Yes |
| **EXAMPLE** | Yes | No |
| **FEDERATED** | Yes | Yes |
| **HEAP** | Yes | Yes |
| **InnoDB** | Yes | Yes when the transaction isolation level is [**REPEATABLE READ**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#isolevel_repeatable-read) or [**SERIALIZABLE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\innodb-storage-engine.html#isolevel_serializable); No otherwise. |
| **MyISAM** | Yes | Yes |
| **MERGE** | Yes | Yes |
| [**NDB**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\mysql-cluster.html) | Yes | No |

语句是否要被记录以及要使用的记录模式是根据语句的类型（安全、不安全或二进制注入）、二进制记录格式（STATEMENT、ROW或MIXED）以及存储引擎的记录能力（语句能力、行能力、两者或两者都没有）决定的。(二进制注入指的是记录一个必须使用ROW格式记录的变化)。

语句可以在有或没有警告的情况下被记录；失败的语句不被记录，但在日志中产生错误。这在下面的决策表中显示。类型、binlog\_format、SLC和RLC列概述了这些条件，而Error / Warning和Logged as列代表了相应的操作。SLC代表 "能够进行语句日志记录"，RLC代表 "能够进行行日志记录"。

| **Type** | [**binlog\_format**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\replication.html#sysvar_binlog_format) | **SLC** | **RLC** | **Error / Warning** | **Logged as** |
| --- | --- | --- | --- | --- | --- |
| **\*** | **\*** | No | No | Error: Cannot execute statement: Binary logging is impossible since at least one engine is involved that is both row-incapable and statement-incapable. | **-** |
| **Safe** | **STATEMENT** | Yes | No | - | **STATEMENT** |
| **Safe** | **MIXED** | Yes | No | - | **STATEMENT** |
| **Safe** | **ROW** | Yes | No | Error: Cannot execute statement: Binary logging is impossible since **BINLOG\_FORMAT = ROW** and at least one table uses a storage engine that is not capable of row-based logging. | **-** |
| **Unsafe** | **STATEMENT** | Yes | No | Warning: Unsafe statement binlogged in statement format, since **BINLOG\_FORMAT = STATEMENT** | **STATEMENT** |
| **Unsafe** | **MIXED** | Yes | No | Error: Cannot execute statement: Binary logging of an unsafe statement is impossible when the storage engine is limited to statement-based logging, even if **BINLOG\_FORMAT = MIXED**. | **-** |
| **Unsafe** | **ROW** | Yes | No | Error: Cannot execute statement: Binary logging is impossible since **BINLOG\_FORMAT = ROW** and at least one table uses a storage engine that is not capable of row-based logging. | - |
| **Row Injection** | **STATEMENT** | Yes | No | Error: Cannot execute row injection: Binary logging is not possible since at least one table uses a storage engine that is not capable of row-based logging. | - |
| **Row Injection** | **MIXED** | Yes | No | Error: Cannot execute row injection: Binary logging is not possible since at least one table uses a storage engine that is not capable of row-based logging. | - |
| **Row Injection** | **ROW** | Yes | No | Error: Cannot execute row injection: Binary logging is not possible since at least one table uses a storage engine that is not capable of row-based logging. | - |
| **Safe** | **STATEMENT** | No | Yes | Error: Cannot execute statement: Binary logging is impossible since **BINLOG\_FORMAT = STATEMENT** and at least one table uses a storage engine that is not capable of statement-based logging. | **-** |
| **Safe** | **MIXED** | No | Yes | - | **ROW** |
| **Safe** | **ROW** | No | Yes | - | **ROW** |
| **Unsafe** | **STATEMENT** | No | Yes | Error: Cannot execute statement: Binary logging is impossible since **BINLOG\_FORMAT = STATEMENT** and at least one table uses a storage engine that is not capable of statement-based logging. | - |
| **Unsafe** | **MIXED** | No | Yes | - | **ROW** |
| **Unsafe** | **ROW** | No | Yes | - | **ROW** |
| **Row Injection** | **STATEMENT** | No | Yes | Error: Cannot execute row injection: Binary logging is not possible since **BINLOG\_FORMAT = STATEMENT**. | **-** |
| **Row Injection** | **MIXED** | No | Yes | - | **ROW** |
| **Row Injection** | **ROW** | No | Yes | - | **ROW** |
| **Safe** | **STATEMENT** | Yes | Yes | - | **STATEMENT** |
| **Safe** | **MIXED** | Yes | Yes | - | **STATEMENT** |
| **Safe** | **ROW** | Yes | Yes | - | **ROW** |
| **Unsafe** | **STATEMENT** | Yes | Yes | Warning: Unsafe statement binlogged in statement format since **BINLOG\_FORMAT = STATEMENT**. | **STATEMENT** |
| **Unsafe** | **MIXED** | Yes | Yes | - | **ROW** |
| **Unsafe** | **ROW** | Yes | Yes | - | **ROW** |
| **Row Injection** | **STATEMENT** | Yes | Yes | Error: Cannot execute row injection: Binary logging is not possible because **BINLOG\_FORMAT = STATEMENT**. | - |
| **Row Injection** | **MIXED** | Yes | Yes | - | **ROW** |
| **Row Injection** | **ROW** | Yes | Yes | - | **ROW** |

当确定产生警告时，会产生一个标准的MySQL警告（可使用SHOW WARNINGS）。该信息也被写到mysqld错误日志中。每个客户端连接的每个错误实例只有一个错误被记录，以防止淹没日志。日志信息包括所尝试的SQL语句。

如果一个副本将log\_error\_verbosity设置为显示警告，该副本将信息打印到错误日志，以提供关于其状态的信息，例如它开始工作的二进制日志和中继日志坐标，它何时切换到另一个中继日志，它在断开连接后何时重新连接，对于基于语句的日志不安全的语句，等等。

#### 5.4.4.4 Logging Format for Changes to mysql Database Tables

mysql数据库中授予表的内容可以直接（例如，用INSERT或DELETE）或间接（例如，用GRANT或CREATE USER）被修改。影响mysql数据库表的语句使用以下规则写到二进制日志中。

- 直接改变mysql数据库表中数据的数据操作语句，根据binlog\_format系统变量的设置进行记录。这与INSERT、UPDATE、DELETE、REPLACE、DO、LOAD DATA、SELECT和TRUNCATE TABLE等语句有关。

- 无论binlog\_format的值如何，间接改变mysql数据库的语句都被记录为语句。这与GRANT、REVOKE、SET PASSWORD、RENAME USER、CREATE（所有形式，除了CREATE TABLE ... SELECT）、ALTER（所有形式）和DROP（所有形式）等语句有关。

创建表...。SELECT是一个数据定义和数据操作的组合。CREATE TABLE部分使用语句格式进行记录，SELECT部分根据binlog\_format的值进行记录。

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#### 5.4.4.5 Binary Log Transaction Compression

从MySQL 8.0.20开始，你可以在MySQL服务器实例上启用二进制日志事务压缩。当启用二进制日志事务压缩时，事务有效载荷使用zstd算法进行压缩，然后作为一个单一事件（Transaction\_payload\_event）写入服务器的二进制日志文件。当它们在复制流中被发送到副本、其他组复制组成员或客户（如mysqlbinlog）时，压缩的事务有效载荷保持在压缩状态。它们不会被接收线程解压缩，并且仍然以压缩状态被写入中继日志。因此，二进制日志事务压缩节省了事务发起者和接收者（以及他们的备份）的存储空间，并在服务器实例之间发送事务时节省了网络带宽。

当需要检查其中包含的单个事件时，压缩的事务有效载荷被解压缩。例如，Transaction\_payload\_event被applier线程解压，以便在收件人身上应用它所包含的事件。在恢复期间，mysqlbinlog在重放事务时，以及通过SHOW BINLOG EVENTS和SHOW RELAYLOG EVENTS语句，也会进行解压。

你可以使用binlog\_transaction\_compression系统变量在MySQL服务器实例上启用二进制日志事务压缩，该变量默认为OFF。你也可以使用binlog\_transaction\_compression\_level\_zstd系统变量来设置用于压缩的zstd算法的级别。这个值决定了压缩力度，从1（最低力度）到22（最高力度）。随着压缩级别的增加，压缩率也会增加，这就减少了交易有效载荷所需的存储空间和网络带宽。然而，数据压缩所需的努力也会增加，需要花费时间和CPU及内存资源在始发服务器上。压缩工作量的增加与压缩率的增加没有线性关系。

以下类型的事件被排除在二进制日志事务压缩之外，所以总是未经压缩地写入二进制日志中。

- 与交易的GTID有关的事件（包括匿名的GTID事件）。

- 其他类型的控制事件，如视图改变事件和心跳事件。

- 事件和包含它们的任何事务的整体。

- 非交易性事件和包含它们的任何交易的整体。涉及非交易型和交易型存储引擎混合的交易不会对其有效载荷进行压缩。

- 使用基于语句的二进制日志记录的事件。二进制日志事务压缩只适用于基于行的二进制日志格式。

二进制日志加密可以用在包含压缩事务的二进制日志文件上。

##### 5.4.4.5.1 Behaviors When Binary Log Transaction Compression is Enabled

具有被压缩的有效载荷的事务可以像其他事务一样被回滚，它们也可以通过常规的过滤选项在副本中被过滤掉。二进制日志事务压缩可以应用于XA事务。

当二进制日志事务压缩被启用时，服务器的max\_allowed\_packet和slave\_max\_allowed\_packet限制仍然适用，并且是根据Transaction\_payload\_event的压缩大小，加上用于事件头的字节来衡量。请注意，压缩的事务有效载荷是作为一个单一的数据包发送的，而不是像不使用二进制日志事务压缩时那样，将事务的每个事件放在一个单独的数据包中发送。

对于多线程工作者，每个事务（包括其GTID事件和Transaction\_payload\_event）被分配给一个工作者线程。工作者线程解压事务有效载荷，并逐一应用其中的各个事件。如果发现应用Transaction\_payload\_event中的任何事件有错误，整个交易将被报告给协调者，因为它已经失败了。当slave\_parallel\_type被设置为DATABASE时，所有受事务影响的数据库都会在事务计划前被映射。与未压缩的事务相比，使用DATABASE策略的二进制日志事务压缩可以减少并行性，因为后者是为每个事件进行映射和调度。

对于半同步复制（见第17.4.10节，"半同步复制"），当收到完整的Transaction\_payload\_event时，复制体会确认事务。

当启用二进制日志校验（这是默认的）时，复制源服务器不为压缩的事务有效载荷中的单个事件写校验和。相反，为完整的Transaction\_payload\_event写一个校验和，并为任何未压缩的事件写独立的校验和，例如与GTIDs有关的事件。

对于SHOW BINLOG EVENTS和SHOW RELAYLOG EVENTS语句，Transaction\_payload\_event首先被打印成一个单元，然后被解压，里面的每个事件都被打印。

对于引用事件结束位置的操作，例如带有UNTIL子句的START REPLICA | SLAVE，MASTER\_POS\_WAIT()，以及sql\_slave\_skip\_counter，必须指定压缩的事务有效载荷（Transaction\_payload\_event）的结束位置。当使用 sql\_slave\_skip\_counter 来跳过事件时，压缩的事务有效载荷会被算作一个单独的计数器值，所以它里面的所有事件都会被作为一个单元跳过。

##### 5.4.4.5.2 Combining Compressed and Uncompressed Transaction Payloads

支持二进制日志事务压缩的MySQL服务器版本可以处理压缩和未压缩的事务有效载荷的混合。

- 与二进制日志事务压缩有关的系统变量不需要在所有组复制组成员上设置相同，并且在复制拓扑中不从源头复制到复制体。你可以决定二进制日志事务压缩是否适合每个有二进制日志的MySQL Server实例。

- 如果在一台服务器上启用了事务压缩，然后又禁用了，那么压缩就不会应用于今后在该服务器上发起的事务，但已被压缩的事务有效载荷仍然可以被处理和显示。

- 如果通过设置binlog\_transaction\_compression的会话值为单个会话指定事务压缩，二进制日志可以包含压缩和未压缩的事务有效载荷的混合。

当复制拓扑中的源和它的复制体都启用了二进制日志事务压缩时，复制体接收压缩的事务有效载荷并将它们压缩后写入中继日志。它解压交易有效载荷以应用交易，然后在应用后再次压缩它们以写入其二进制日志。任何下游的复制体都会收到压缩的交易有效载荷。

当复制拓扑中的一个源启用了二进制日志事务压缩，但其副本没有，该副本接收压缩的事务有效载荷，并将其压缩后写入其中继日志。它解压交易有效载荷以应用交易，然后将它们未压缩地写入自己的二进制日志，如果它有的话。任何下游的复制体都会收到未压缩的交易有效载荷。

当复制拓扑中的源没有启用二进制日志事务压缩，但它的副本启用了，如果副本有二进制日志，它在应用事务有效载荷后压缩它们，并将压缩的事务有效载荷写入它的二进制日志。任何下游的副本都会收到压缩的事务有效载荷。

当MySQL服务器实例没有二进制日志时，如果它处于MySQL 8.0.20之后的版本，它可以接收、处理和显示压缩的事务有效载荷，而不管其binlog\_transaction\_compression的值如何。这种服务器实例收到的压缩事务有效载荷以其压缩状态写入中继日志，因此它们间接地受益于复制拓扑中其他服务器所进行的压缩。

在MySQL 8.0.20之前发布的副本不能从启用了二进制日志事务压缩的来源进行复制。在MySQL 8.0.20或以上版本的副本可以从不支持二进制日志事务压缩的早期版本的源复制，并且可以在将事务写入自己的二进制日志时对从该源接收的事务进行自己的压缩。

##### 5.4.4.5.3 Monitoring Binary Log Transaction Compression

你可以使用性能模式表binary\_log\_transaction\_compression\_stats来监控二进制日志事务压缩的效果。这些统计数据包括监测期间的数据压缩率，你还可以查看压缩对服务器上最后一个事务的影响。你可以通过截断该表来重置统计数据。二进制日志和中继日志的统计数据被分割出来，这样你就可以看到压缩对每种日志类型的影响。MySQL服务器实例必须有一个二进制日志以产生这些统计数据。

性能模式表events\_stages\_current显示一个事务何时处于其事务有效载荷的解压或压缩阶段，并显示其在这个阶段的进展。压缩是由处理事务的工作线程进行的，就在事务提交之前，只要在最终的捕获缓存中没有将事务排除在二进制日志事务压缩之外的事件（例如，事件）。当需要解压缩时，每次对有效载荷中的一个事件进行解压缩。

带有--verbose选项的mysqlbinlog包括注释，说明压缩交易有效载荷的压缩大小和未压缩大小，以及所使用的压缩算法。

你可以使用CHANGE REPLICATION SOURCE TO语句（从MySQL 8.0.23开始）或CHANGE MASTER TO语句（在MySQL 8.0.23之前）的SOURCE\_COMPRESSION\_ALGORITHMS | MASTER\_COMPRESSION\_ALGORITHMS和SOURCE\_ZSTD\_COMPRESSION\_LEVEL | MASTER\_ZSTD\_COMPRESSION\_LEVELoptions，或被废弃的slave\_compressed\_protocol系统变量，在协议层面上为复制连接启用连接压缩。如果你在一个也启用了连接压缩的系统中启用二进制日志事务压缩，连接压缩的影响就会减少，因为可能没有什么机会进一步压缩压缩的事务有效载荷。然而，连接压缩仍然可以在未压缩的事件和消息头上操作。如果你需要节省存储空间以及网络带宽，可以将二进制日志事务压缩与连接压缩结合起来启用。关于复制连接压缩的更多信息，见第4.2.8节，"连接压缩控制"。

对于组复制，对于超过group\_replication\_compression\_threshold系统变量设置的阈值的消息，默认情况下会启用压缩。你也可以使用group\_replication\_recovery\_compression\_algorithms和group\_replication\_recovery\_zstd\_compression\_level这两个系统变量，为通过捐赠者的二进制日志的状态转移方法为分布式恢复发送的消息配置压缩。如果你在配置了这些的系统中启用二进制日志事务压缩，Group Replication的消息压缩仍然可以在未压缩的事件和消息头上操作，但其影响会减少。关于Group Replication的消息压缩的更多信息，请参阅第18.7.3节，"消息压缩"。

### 5.4.5慢查询日志

慢速查询日志由执行时间超过long\_query\_time秒且至少需要检查min\_examined\_row\_limit行的SQL语句组成。慢速查询日志可以用来寻找那些需要长时间执行的查询，因此是优化的候选者。然而，检查一个长的慢速查询日志可能是一个耗时的任务。为了使之更容易，你可以使用mysqldumpslow命令来处理一个慢速查询日志文件并总结其内容。见第4.6.10节，"mysqldumpslow--总结慢速查询日志文件"。

获取初始锁的时间不计入执行时间。mysqld在语句被执行和所有锁被释放后将其写入慢速查询日志，所以日志顺序可能与执行顺序不同。

- 慢速查询日志参数

- 慢速查询日志内容

#### Slow Query Log Parameters

long\_query\_time的最小值和默认值分别为0和10。该值可以被指定为微秒的分辨率。

默认情况下，管理语句不被记录，不使用索引查找的查询也不被记录。这种行为可以使用log\_slow\_admin\_statements和log\_queries\_not\_using\_indexes来改变，后面会介绍。

默认情况下，慢速查询日志是禁用的。要明确指定慢速查询日志的初始状态，请使用--slow\_query\_log[={0|1}]。在没有参数或参数为1的情况下， --slow\_query\_log启用日志。如果参数为0，该选项将禁用日志。要指定一个日志文件名，使用 --slow\_query\_log\_file=file\_name。要指定日志目的地，请使用log\_output系统变量（如第5.4.1节 "选择一般查询日志和慢速查询日志的输出目的地 "中所述）。

注意

如果你指定了TABLE日志目的地，请参阅日志表和 "太多开放文件 "错误。

如果你没有为慢速查询日志文件指定名称，默认名称是host\_name-slow.log。服务器会在数据目录下创建该文件，除非给出一个绝对路径名来指定一个不同的目录。

要想在运行时禁用或启用慢速查询日志或改变日志文件的名称，可以使用全局的slow\_query\_log和slow\_query\_log\_file系统变量。将slow\_query\_log设为0以禁用该日志，或设为1以启用它。设置slow\_query\_log\_file来指定日志文件的名称。如果一个日志文件已经打开，它将被关闭，新的文件将被打开。

如果你使用--log-short-format选项，服务器会向慢速查询日志写入较少的信息。

要在慢速查询日志中包括慢速管理语句，请启用log\_slow\_admin\_statements系统变量。管理语句包括ALTER TABLE, ANALYZE TABLE, CHECK TABLE, CREATE INDEX, DROP INDEX, OPTIMIZE TABLE, 和 REPAIR TABLE。

要想在写入慢速查询日志的语句中包括那些不使用索引的查询，请启用log\_queries\_not\_using\_indexes系统变量。(即使启用了这个变量，服务器也不会记录那些由于表少于两行而无法从索引的存在中受益的查询。)

当不使用索引的查询被记录时，慢速查询日志可能会迅速增长。可以通过设置log\_throttle\_queries\_not\_using\_indexes系统变量对这些查询进行速率限制。默认情况下，这个变量是0，这意味着没有限制。正值对不使用索引的查询的记录施加每分钟的限制。第一个这样的查询会打开一个60秒的窗口，在这个窗口中，服务器会记录到给定限制的查询，然后抑制其他的查询。如果在窗口结束时还有被抑制的查询，服务器会记录一个摘要，指出有多少查询以及在这些查询中花费的总时间。下一个60秒窗口从服务器记录下一个不使用索引的查询时开始。

服务器按照以下顺序使用控制参数来决定是否将查询写入慢速查询日志。

1. 该查询必须不是一个管理语句，或者必须启用log\_slow\_admin\_statements。

2. 2.查询必须花费至少long\_query\_time秒，或者必须启用log\_queries\_not\_using\_indexes，并且查询没有使用索引进行行查找。

3. 3. 该查询必须至少检查了min\_examined\_row\_limit行。

4. 4. 根据log\_throttle\_queries\_not\_using\_indexes设置，该查询必须没有被抑制。

log\_timestamps系统变量控制写入慢速查询日志文件（以及一般查询日志文件和错误日志）的消息中的时间戳的时区。它不影响写到日志表中的一般查询日志和慢速查询日志信息的时区，但是从这些表中检索的行可以通过CONVERT\_TZ()或设置会话时区系统变量从本地系统时区转换到任何需要的时区。

默认情况下，副本不会将复制的查询写到慢速查询日志中。要改变这一点，请启用log\_slow\_slave\_statements系统变量。注意，如果使用了基于行的复制（binlog\_format=ROW），log\_slow\_slave\_statements没有影响。只有当查询在二进制日志中以语句格式记录时，即binlog\_format=STATEMENT，或者binlog\_format=MIXED且语句以语句格式记录时，才会被添加到副本的慢查询日志中。当binlog\_format=MIXED被设置时，以行格式记录的慢速查询，或者当binlog\_format=ROW被设置时，即使log\_slow\_slave\_statements被启用，也不会被添加到副本的慢速查询日志。

#### Slow Query Log Contents

当慢速查询日志被启用时，服务器会将输出写入log\_output系统变量所指定的任何目的地。如果你启用了该日志，服务器会打开日志文件并向其写入启动信息。然而，除非选择了FILE日志目标，否则不会发生进一步的查询日志记录到文件。如果目的地是NONE，即使启用了慢速查询日志，服务器也不写查询。如果没有选择FILE作为输出目标，设置日志文件名对日志记录没有影响。

如果启用了慢速查询日志，并选择FILE作为输出目的地，则写入日志的每条语句前面都有一行以#字符开始，并有这些字段（所有字段在一行）。

- Query\_time: duration

语句的执行时间，单位是秒。

- Lock\_time: 持续时间

获得锁的时间，以秒计。

- Rows\_sent: N

发送给客户端的行数。

- Rows\_examined:

服务器层检查的行数（不计入存储引擎的任何内部处理）。

启用log\_slow\_extra系统变量（从MySQL 8.0.14开始可用）会导致服务器在刚刚列出的字段之外向FILE输出写入以下额外字段（TABLE输出不受影响）。一些字段的描述是指状态变量的名称。更多信息请查阅状态变量的描述。然而，在慢速查询日志中，这些计数器是每个语句的值，而不是每个会话的累积值。

- Thread\_id: ID

语句线程标识符。

- Errno: error\_number

语句错误编号，如果没有发生错误，则为0。

- 杀死。N

如果语句被终止，说明原因的错误号码，如果语句正常终止，则为0。

- Bytes\_received: N

语句的Bytes\_received值。

- Bytes\_sent: N

语句的Bytes\_sent值。

- Read\_first（先读）。N

语句的Handler\_read\_first值。

- Read\_last: N

语句的Handler\_read\_last值。

- Read\_key: N

语句的Handler\_read\_key值。

- Read\_next（下一个）。N

语句的Handler\_read\_next值。

- Read\_prev: N

语句的Handler\_read\_prev值。

- Read\_rnd: N

语句的Handler\_read\_rnd值。

- Read\_rnd\_next: N

语句的Handler\_read\_rnd\_next值。

- Sort\_merge\_passes: N

语句的Sort\_merge\_passes值。

- 排序\_range\_count。N

语句的Sort\_range值。

- Sort\_rows。N

语句的Sort\_rows值。

- Sort\_scan\_count。N

语句的Sort\_scan值。

- Created\_tmp\_disk\_tables: N

语句中Created\_tmp\_disk\_tables的值。

- Created\_tmp\_tables: N

语句的Created\_tmp\_tables值。

- 开始：时间戳

语句执行的开始时间。

- 结束：时间戳

语句执行的结束时间。

一个给定的慢速查询日志文件可能包含混合的行，其中有或没有通过启用log\_slow\_extra增加的额外字段。日志文件分析器可以通过字段计数来确定某一行是否包含额外字段。

写入慢速查询日志文件的每条语句前面都有一个SET语句，其中包括一个时间戳。从MySQL 8.0.14开始，时间戳表示慢速语句开始执行的时间。在8.0.14之前，时间戳表示慢速语句被记录的时间（这发生在语句执行完毕之后）。

写入慢速查询日志的语句中的密码会被服务器重写，不会以纯文本形式出现。见第6.1.2.3节，"密码和日志"。

### 5.4.6 服务器日志维护

如第5.4节 "MySQL服务器日志 "中所述，MySQL服务器可以创建几个不同的日志文件，以帮助你看到正在发生的活动。然而，你必须定期清理这些文件，以确保日志不会占用太多的磁盘空间。

当使用启用了日志记录的MySQL时，你可能想不时地备份和删除旧的日志文件，并告诉MySQL开始向新的文件记录日志。见第7.2节，"数据库备份方法"。

在Linux（Red Hat）安装中，你可以使用mysql-log-rotate脚本进行日志维护。如果你从RPM发行版中安装MySQL，这个脚本应该已经自动安装。如果你使用二进制日志进行复制，要小心使用这个脚本。你不应该删除二进制日志，直到你确定它们的内容已经被所有的复制体处理。

在其他系统上，你必须自己安装一个简短的脚本，从cron（或其等价物）启动，用于处理日志文件。

二进制日志文件在服务器的二进制日志过期后被自动删除。文件的删除可以在启动时和二进制日志被刷新时进行。默认的二进制日志过期时间是30天。要指定一个替代的过期时间，使用binlog\_expire\_logs\_seconds系统变量。如果你正在使用复制，你应该指定一个过期时间，不低于你的复制可能落后于源的最大时间量。要按要求删除二进制日志，请使用PURGE BINARY LOGS语句（见第13.4.1.1节，"PURGE BINARY LOGS语句"）。

要迫使MySQL开始使用新的日志文件，请冲刷日志。当你执行FLUSH LOGS语句或mysqladmin flush-logs、mysqladmin refresh、mysqldump --flush-logs或mysqldump --master-data命令时，会发生日志冲刷。参见第13.7.8.3节 "FLUSH语句"，第4.5.2节 "mysqladmin--一个MySQL服务器管理程序"，以及第4.5.4节 "mysqldump--一个数据库备份程序"。此外，当当前二进制日志文件大小达到max\_binlog\_size系统变量的值时，服务器会自动刷新二进制日志。

FLUSH LOGS支持可选的修饰词，以实现对单个日志的选择性刷新（例如，FLUSH BINARY LOGS）。参见第13.7.8.3节，"FLUSH语句"。

日志刷新操作有以下效果。

- 如果启用了二进制日志，服务器会关闭当前的二进制日志文件，并以下一个序列号打开一个新的日志文件。

- 如果启用了一般查询日志或慢速查询日志到一个日志文件，服务器会关闭并重新打开日志文件。

- 如果服务器是用--log-error选项启动的，以使错误日志被写到一个文件中，服务器会关闭并重新打开日志文件。

执行日志刷新语句或命令需要使用具有RELOAD权限的账户连接到服务器。在Unix和类Unix系统中，另一种冲洗日志的方法是向服务器发送一个信号，这可以由root或拥有服务器进程的账户来完成。(见第4.10节，"MySQL中的Unix信号处理"。)信号使日志刷新可以在不需要连接到服务器的情况下进行。

- 一个SIGHUP信号会刷新所有的日志。然而，SIGHUP有除日志刷新之外的其他效果，可能是不可取的。

- 从MySQL 8.0.19开始，SIGUSR1导致服务器刷新错误日志、一般查询日志和缓慢查询日志。如果你只对刷新这些日志感兴趣，SIGUSR1可以作为一个更 "轻量级 "的信号，没有与日志无关的SIGHUP效应。

如前所述，冲刷二进制日志会创建一个新的二进制日志文件，而冲刷一般查询日志、慢速查询日志或错误日志只是关闭并重新打开日志文件。对于后一种日志，要想在Unix系统中导致一个新的日志文件被创建，在冲刷之前先重命名当前的日志文件。在冲刷时，服务器会用原来的名字打开新的日志文件。例如，如果一般查询日志、慢速查询日志和错误日志文件被命名为mysql.log、mysql-slow.log和err.log，你可以在命令行中使用一系列这样的命令。

cd mysql-data-directory

mv mysql.log mysql.log.old

mv mysql-slow.log mysql-slow.log.old

mv err.log err.log.old

mysqladmin flush-logs

在Windows上，使用rename而不是mv。

在这一点上，你可以对mysql.log.old、mysql-slow.log.old和err.log.old进行备份，然后从磁盘中删除它们。

要在运行时重命名一般查询日志或慢速查询日志，首先连接到服务器并禁用该日志。

SET GLOBAL general\_log = 'OFF';

设置GLOBAL slow\_query\_log = 'OFF'。

禁用日志后，从外部重命名日志文件（例如，从命令行）。然后再次启用日志。

SET GLOBAL general\_log = 'ON';

SET GLOBAL slow\_query\_log = 'ON';

这种方法可以在任何平台上使用，而且不需要重新启动服务器。

注意事项

注意

在你从外部重命名一个特定的日志文件后，服务器要重新创建该文件，该文件的位置必须是可以被服务器写入的。这可能并不总是这样的。例如，在Linux上，服务器可能将错误日志写成/var/log/mysqld.log，其中/var/log由root拥有，并且不能被mysqld写入。在这种情况下，日志刷新操作无法创建一个新的日志文件。

要处理这种情况，你必须在重命名原始日志文件后，以适当的所有权手动创建新的日志文件。例如，以root身份执行这些命令。

mv /var/log/mysqld.log /var/log/mysqld.log.old

install -omysql -gmysql -m0644 /dev/null /var/log/mysqld.log

## 5.5 MySQL组件

5.5.1 安装和卸载组件

5.5.2 获取组件信息

5.5.3 错误日志组件

5.5.4 查询属性组件

MySQL服务器包括一个基于组件的基础设施，用于扩展服务器功能。一个组件提供对服务器和其他组件可用的服务。在服务使用方面，服务器是一个组件，与其他组件平等。组件之间只通过它们提供的服务进行交互。

MySQL发行版包括几个实现服务器扩展的组件。

- 用于配置错误日志的组件。见第5.4.2节 "错误日志"，和第5.5.3节 "错误日志组件"。

- 一个用于检查密码的组件。见第6.4.3节，"密码验证组件"。

- 钥匙圈组件为敏感信息提供安全存储。见第6.4.4节，"MySQL钥匙圈"。

- 一个组件，使应用程序能够将他们自己的消息事件添加到审计日志中。见第6.4.6节，"审计消息组件"。

- 一个组件，实现了访问查询属性的可加载函数。参见第9.6节，"查询属性"。

由组件实现的系统和状态变量在组件安装时被暴露出来，其名称以组件特有的前缀开始。例如，log\_filter\_dragnet 错误日志过滤器组件实现了一个名为 log\_error\_filter\_rules 的系统变量，其全名是 dragnet.log\_error\_filter\_rules。要引用这个变量，请使用全名。

下面几节描述了如何安装和卸载组件，以及如何在运行时确定哪些组件已被安装并获取它们的信息。

关于组件的内部实现的信息，请参阅MySQL Server Doxygen文档，可在https://dev.mysql.com/doc/index-other.html。例如，如果你打算编写你自己的组件，这些信息对于理解组件的工作方式很重要。

### 5.5.1安装和卸载组件

组件在使用前必须被加载到服务器中。MySQL支持在运行时手动加载组件和在服务器启动时自动加载。

当一个组件被加载时，关于它的信息可在第5.5.2节 "获取组件信息 "中描述。

INSTALL COMPONENT和UNINSTALL COMPONENT SQL语句可以实现组件的加载和卸载。比如说。

INSTALL COMPONENT 'file://component\_validate\_password';

UNINSTALL COMPONENT 'file://component\_validate\_password';

一个加载器服务处理组件的加载和卸载，并且还在mysql.component系统表中注册加载的组件。

操作组件的SQL语句影响服务器的操作和mysql.component系统表，具体如下。

- INSTALL COMPONENT 向服务器加载组件。这些组件立即变得活跃。装载器服务还在mysql.component系统表中注册了加载的组件。对于随后的服务器重启，加载器服务会在启动序列中加载mysql.component中列出的任何组件。即使服务器是以 --skip-grant-tables 选项启动的，也会发生这种情况。

- UNINSTALL COMPONENT 停用组件并从服务器上卸载它们。装载器服务也从mysql.component系统表中取消了组件的注册，以便服务器在其启动序列中不再为随后的重启加载它们。

与相应的用于服务器插件的INSTALL PLUGIN语句相比，用于组件的INSTALL COMPONENT语句提供了一个显著的优势，即不需要知道任何平台特定的文件名后缀来命名组件。这意味着一个给定的INSTALL COMPONENT语句可以跨平台统一执行。

一个组件在安装时也可以自动安装相关的可加载函数。如果是这样，该组件在卸载时也会自动卸载这些功能。

### 5.5.2 获取组件信息

mysql.component sytem表包含了当前加载的组件的信息，并显示哪些组件已经使用INSTALL COMPONENT注册。从该表中选择显示哪些组件已经安装。比如说。

mysql> **SELECT \* FROM mysql.component;**

+--------------+--------------------+------------------------------------+

| component\_id | component\_group\_id | component\_urn |

+--------------+--------------------+------------------------------------+

| 1 | 1 | file://component\_validate\_password |

| 2 | 2 | file://component\_log\_sink\_json |

+--------------+--------------------+------------------------------------+

component\_id和component\_group\_id的值是内部使用的。component\_urn是在INSTALL COMPONENT和UNINSTALL COMPONENT语句中用来加载和卸载组件的URN。

### 5.5.3 错误日志组件

本节描述了各个错误日志组件的特点。关于配置错误日志的一般信息，请参见第5.4.2节，"错误日志"。

一个日志组件可以是一个过滤器或一个水槽。

- 过滤器处理日志事件，以添加、删除或修改事件字段，或完全删除事件。所产生的事件会传递到启用组件列表中的下一个日志组件。

- 水槽是日志事件的目的地（写作者）。通常，一个汇将日志事件处理成具有特定格式的日志消息，并将这些消息写入其相关的输出，如文件或系统日志。水槽也可以写到Performance Schema的error\_log表；见第27.12.21.1节，"error\_log表"。事件未经修改地传递到启用的组件列表中的下一个日志组件（也就是说，尽管水槽格式化事件以产生输出消息，但它不会修改事件，因为它们在内部传递到下一个组件）。

log\_error\_services系统变量值列出了启用的日志组件。列表中未命名的组件被禁用。

下面的章节描述了各个日志组件，按组件类型分组。

- 过滤器错误日志组件

- 水槽错误日志组件

组件描述包括这些类型的信息。

- 组件名称和预期目的。

- 该组件是内置的还是必须加载的。对于可加载的组件，描述中指定了URN，用于通过INSTALL COMPONENT和UNINSTALL COMPONENT语句加载和卸载该组件。

- 该组件是否可以在log\_error\_services值中多次列出。

- 对于一个sink组件，该组件写入输出的目的地。

- 对于一个汇入点组件，它是否支持一个到Performance Schema error\_log表的接口。

#### Filter Error Log Components

错误日志过滤组件实现对错误日志事件的过滤。如果没有启用过滤组件，就不会发生过滤。

任何启用的过滤组件只对log\_error\_services值中列在后面的组件影响日志事件。特别是，对于log\_error\_services中列在比任何过滤组件更早的任何日志水槽组件，不会发生日志事件过滤。

log\_filter\_internal组件

- 目的：根据日志事件的优先级和错误代码，结合log\_error\_verbosity和log\_error\_suppression\_list系统变量，实施过滤功能。参见第5.4.2.5节，"基于优先级的错误日志过滤（log\_filter\_internal）"。

- URN: 这个组件是内置的，在使用前不需要用INSTALL COMPONENT加载。

- 允许多次使用：不允许。

如果log\_filter\_internal被禁用，log\_error\_verbosity和log\_error\_suppression\_list就没有作用。

log\_filter\_dragnet组件

- 目的：根据 dragnet.log\_error\_filter\_rules 系统变量设置中定义的规则实施过滤。参见第 5.4.2.6 节 "基于规则的错误日志过滤（log\_filter\_dragnet）"。

- URN: file://component\_log\_filter\_dragnet

- 允许多次使用：不允许。

水槽错误日志组件

错误日志汇入组件是实现错误日志输出的写入器。如果没有启用水槽组件，就不会发生日志输出。

一些水槽组件的描述提到了默认的错误日志目的地。这是控制台或一个文件，由log\_error系统变量的值表示，如第5.4.2.2节 "默认错误日志目的地配置 "中所述，确定。

log\_sink\_internal组件

- 目的：执行传统的错误日志消息输出格式。

- URN：这个组件是内置的，使用前不需要用INSTALL COMPONENT加载。

- 允许多次使用：不允许。

- 输出目的地。写到默认的错误日志目的地。

- 支持性能模式。写入error\_log表。提供一个解析器，用于读取以前服务器实例创建的错误日志文件。

log\_sink\_json组件

- 目的：实现JSON格式的错误日志记录。参见第5.4.2.7节 "JSON格式的错误日志"。

- URN: file://component\_log\_sink\_json

- 允许多次使用：是。

- 输出目的地。这个水槽根据默认的错误日志目的地来决定其输出目的地，这个目的地是由log\_error系统变量给出的。

o 如果log\_error命名了一个文件，水槽就会根据该文件名来命名输出文件，加上一个编号为.NN.json的后缀，NN从00开始。例如，如果log\_error是file\_name，在log\_error\_services值中命名的log\_sink\_json的连续实例会写入file\_name.00.json、file\_name.01.json，依此类推。

o 如果log\_error是stderr，那么sink会写到控制台。如果log\_sink\_json在log\_error\_services值中被多次命名，它们都会写到控制台，这很可能没有用。

- 性能模式支持。写入error\_log表。提供一个解析器，用于读取以前服务器实例创建的错误日志文件。

log\_sink\_syseventlog组件

- 目的：将错误日志记录到系统日志中。这在Windows中是事件日志，在Unix和类Unix系统中是syslog。请参阅第5.4.2.8节 "错误记录到系统日志"。

- URN: file://component\_log\_sink\_syseventlog

- 允许多次使用：不允许。

- 输出目的地。写到系统日志。不使用默认的错误日志目的地。

- 支持性能模式。不写到error\_log表。不提供读取以前服务器实例创建的错误日志文件的分析器。

log\_sink\_test组件

- 目的：用于编写测试案例的内部使用，不用于生产使用。

- URN: file://component\_log\_sink\_test

log\_sink\_test没有指定汇的属性，如是否允许多次使用和输出目的地，因为如前所述，它是供内部使用的。因此，它的行为可以随时改变。

### 5.5.4 查询属性组件

从MySQL 8.0.23开始，一个组件服务提供对查询属性的访问（见第9.6节，"查询属性"）。query\_attributes组件使用该服务来提供对SQL语句中查询属性的访问。

- 目的：执行 mysql\_query\_attribute\_string() 函数，该函数接收一个属性名称参数并以字符串形式返回属性值，如果属性不存在，则返回 NULL。

- URN：file://component\_query\_attributes

希望纳入query\_attributes所使用的相同的查询属性组件服务的开发者应该查阅MySQL源码分发中的mysql\_query\_attributes.h文件。

## 5.6 MySQL服务器插件

5.6.1 安装和卸载插件

5.6.2 获取服务器插件信息

5.6.3 MySQL企业线程池

5.6.4 重写器查询重写插件

5.6.5 ddl\_rewriter插件

5.6.6 版本令牌

5.6.7 克隆插件

5.6.8 Keyring代理桥插件

5.6.9 MySQL插件服务

MySQL支持一个插件API，可以创建服务器插件。插件可以在服务器启动时加载，也可以在运行时加载和卸载，而无需重新启动服务器。这个接口支持的插件包括但不限于存储引擎、INFORMATION\_SCHEMA表、全文分析器插件和服务器扩展。

MySQL发行版包括几个实现服务器扩展的插件。

- 用于验证客户端连接到MySQL服务器的尝试的插件。插件可用于几种认证协议。见第6.2.17节，"可插入的认证"。

- 一个连接控制插件，使管理员能够在客户机连接尝试连续失败一定次数后引入越来越多的延迟。参见第6.4.2节 "连接控制插件"。

- 一个密码验证插件实现了密码强度策略，并评估了潜在密码的强度。见第6.4.3节 "密码验证组件"。

- 半同步复制插件实现了复制能力的接口，只要至少有一个副本对每个事务做出响应，就允许源程序继续进行。参见第17.4.10节，"半同步复制"。

- 组复制使你能够在一组MySQL服务器实例中创建一个高可用的分布式MySQL服务，其数据一致性、冲突检测和解决以及组成员服务都是内置的。参见第18章，组复制。

- MySQL企业版包括一个线程池插件，它可以管理连接线程，通过有效管理大量客户端连接的语句执行线程来提高服务器性能。参见第5.6.3节，"MySQL企业版线程池"。

- MySQL企业版包括一个审计插件，用于监控和记录连接和查询活动。参见第6.4.5节，"MySQL企业审计"。

- MySQL企业版包括一个防火墙插件，该插件实现了应用级防火墙，使数据库管理员能够根据与所接受的语句模式的允许列表的匹配来允许或拒绝SQL语句的执行。见第6.4.7节，"MySQL企业版防火墙"。

- 查询重写插件检查MySQL服务器收到的语句，并可能在服务器执行前对其进行重写。参见第5.6.4节 "重写器查询重写插件"，以及第5.6.5节 "ddl\_rewriter插件"。

- 版本令牌能够创建和同步服务器令牌，应用程序可以使用这些令牌来防止访问不正确或过时的数据。版本令牌是基于一个插件库，它实现了一个version\_tokens插件和一组可加载函数。参见第5.6.6节，"版本标识"。

- 钥匙圈插件为敏感信息提供安全存储。见第6.4.4节，"MySQL钥匙圈"。

在MySQL 8.0.24中，MySQL Keyring开始从插件过渡到使用组件基础设施，使用名为daemon\_keyring\_proxy\_plugin的插件来促进，该插件充当插件和组件服务API之间的桥梁。见第5.6.8节，"钥匙圈代理桥接插件"。

- X Plugin扩展了MySQL Server，使其能够作为一个文档存储空间发挥作用。运行X Plugin使MySQL服务器能够使用X协议与客户进行通信，该协议旨在将MySQL的ACID兼容存储能力作为文件存储进行公开。参见第20.5节，"X插件"。

- 克隆允许从本地或远程MySQL服务器实例克隆InnoDB数据。参见第5.6.7节，"克隆插件"。

- 测试框架插件测试服务器服务。关于这些插件的信息，请参见MySQL服务器Doxygen文档的测试插件服务部分，可在https://dev.mysql.com/doc/index-other.html。

下面几节描述了如何安装和卸载插件，以及如何在运行时确定哪些插件被安装并获得有关它们的信息。关于编写插件的信息，请参阅《MySQL插件API》

### 5.6.1插件安装与卸载

服务器插件必须在使用前加载到服务器中。MySQL支持在服务器启动和运行时加载插件。也可以在启动时控制加载的插件的激活状态，并在运行时卸载它们。

当一个插件被加载时，关于它的信息可在第5.6.2节 "获取服务器插件信息 "中描述。

- 安装插件

- 控制插件的激活状态

- 卸载插件

- 插件和可加载函数

#### 安装插件

在使用一个服务器插件之前，必须使用下列方法之一来安装它。在描述中，plugin\_name代表一个插件的名称，如innodb、csv或validate\_password。

- 内置插件

- 在mysql.plugin系统表中注册的插件

- 用命令行选项命名的插件

- 用INSTALL PLUGIN语句安装的插件

内置插件

一个内置的插件是由服务器自动知道的。默认情况下，服务器会在启动时启用该插件。一些内置插件允许用--plugin\_name[=activation\_state]选项来改变这一点。

在mysql.plugin系统表中注册的插件

mysql.plugin系统表作为插件的注册表（除内置插件外，不需要注册）。在正常的启动序列中，服务器会加载在该表中注册的插件。默认情况下，对于从mysql.plugin表中加载的插件，服务器也会启用该插件。这可以通过--plugin\_name[=activation\_state]选项来改变。

如果服务器以--skip-grant-tables选项启动，在mysql.plugin表中注册的插件就不会被加载，并且不可用。

Plugins Named with Command-Line Options

位于插件库文件中的插件可以在服务器启动时用 --plugin-load, --plugin-load-add, 或 --early-plugin-load 选项加载。通常情况下，对于在启动时加载的插件，服务器也会启用该插件。这可以通过--plugin\_name[=activation\_state]选项来改变。

--plugin-load和--plugin-load-add选项在服务器启动过程中，在内置插件和存储引擎初始化后加载插件。--early-plugin-load选项用于加载那些必须在内置插件和存储引擎初始化之前可用的插件。

每个插件加载选项的值是一个分号分隔的plugin\_library和name=plugin\_library值的列表。每个plugin\_library是一个包含插件代码的库文件的名称，每个name是要加载的插件的名称。如果一个插件库的名称中没有任何前面的插件名称，服务器就会加载库中的所有插件。如果有一个前面的插件名称，服务器就只从库中加载命名的插件。服务器在由plugin\_dir系统变量命名的目录中寻找插件库文件。

插件加载选项不会在mysql.plugin表中注册任何插件。对于随后的重启，只有在再次给出--plugin-load、--plugin-load-add或--early-plugin-load时，服务器才会再次加载该插件。也就是说，该选项产生了一个一次性的插件安装操作，在一次服务器调用中持续存在。

--plugin-load、--plugin-load-add和--early-plugin-load使插件能够被加载，即使在给出--skip-grant-tables的情况下（这导致服务器忽略mysql.plugin表）。--plugin-load、--plugin-load-add和--early-plugin-load还可以在启动时加载那些在运行时无法加载的插件。

--plugin-load-add选项是对--plugin-load选项的补充。

--plugin-load的每个实例都会重置启动时要加载的插件集，而--plugin-load-add则会在要加载的插件集中添加一个或多个插件，而不会重置当前的插件集。因此，如果指定了多个 --plugin-load 的实例，只有最后一个才适用。如果有多个 --plugin-load-add 的实例，则所有的实例都适用。

- 参数的格式与--plugin-load相同，但可以使用多个--plugin-load-add实例，以避免用一个冗长的--plugin-load参数来指定一大组插件。

--plugin-load-add可以在没有--plugin-load的情况下给出，但是任何出现在--plugin-load之前的--plugin-load-add实例都没有效果，因为--plugin-load会重置要加载的插件集。

例如，这些选项。

--plugin-load=x --plugin-load-add=y

等同于这些选项。

--plugin-load-add=x --plugin-load-add=y

并且也等同于这个选项。

--plugin-load="x;y"

但是这些选项。

--plugin-load-add=y --plugin-load=x

等同于这个选项。

--plugin-load=x

##### Plugins Installed with the INSTALL PLUGIN Statement

A plugin located in a plugin library file can be loaded at runtime with the [**INSTALL PLUGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-plugin) statement. The statement also registers the plugin in the **mysql.plugin** table to cause the server to load it on subsequent restarts. For this reason, [**INSTALL PLUGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-plugin) requires the [**INSERT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_insert) privilege for the **mysql.plugin** table.

The plugin library file base name depends on your platform. Common suffixes are .so for Unix and Unix-like systems, .dll for Windows.

Example: The [--plugin-load-add](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load-add) option installs a plugin at server startup. To install a plugin named **myplugin** from a plugin library file named somepluglib.so, use these lines in a my.cnf file:

[mysqld]

plugin-load-add=myplugin=somepluglib.so

In this case, the plugin is not registered in **mysql.plugin**. Restarting the server without the [--plugin-load-add](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load-add) option causes the plugin not to be loaded at startup.

Alternatively, the [**INSTALL PLUGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-plugin) statement causes the server to load the plugin code from the library file at runtime:

INSTALL PLUGIN myplugin SONAME 'somepluglib.so';

[**INSTALL PLUGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-plugin) also causes “permanent” plugin registration: The plugin is listed in the **mysql.plugin** table to ensure that the server loads it on subsequent restarts.

Many plugins can be loaded either at server startup or at runtime. However, if a plugin is designed such that it must be loaded and initialized during server startup, attempts to load it at runtime using [**INSTALL PLUGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-plugin) produce an error:

mysql> **INSTALL PLUGIN myplugin SONAME 'somepluglib.so';**

ERROR 1721 (HY000): Plugin 'myplugin' is marked as not dynamically

installable. You have to stop the server to install it.

In this case, you must use [--plugin-load](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load), [--plugin-load-add](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load-add), or [--early-plugin-load](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_early-plugin-load).

If a plugin is named both using a [--plugin-load](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load), [--plugin-load-add](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load-add), or [--early-plugin-load](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_early-plugin-load) option and (as a result of an earlier [**INSTALL PLUGIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#install-plugin) statement) in the **mysql.plugin** table, the server starts but writes these messages to the error log:

[ERROR] Function '***plugin\_name***' already exists

[Warning] Couldn't load plugin named '***plugin\_name***'

with soname '***plugin\_object\_file***'.

#### Controlling Plugin Activation State

如果服务器在启动时知道一个插件（例如，因为该插件是用--plugin-load-add选项命名的，或者是在mysql.plugin表中注册的），服务器会默认加载并启用该插件。可以使用--plugin\_name[=activation\_state]启动选项来控制此类插件的激活状态，其中plugin\_name是要影响的插件的名称，例如innodb、csv或validate\_password。与其他选项一样，选项名称中的破折号和下划线可以互换。另外，激活状态值不区分大小写。例如，--my\_plugin=ON和--my-plugin=on是等同的。

--plugin\_name=OFF

告诉服务器禁用该插件。对于某些内置插件，例如mysql\_native\_password，可能无法做到这一点。

--plugin\_name[=ON)

告诉服务器启用该插件。(将该选项指定为--plugin\_name，但不加值，效果相同。)如果该插件不能初始化，则服务器在运行时禁用该插件。

--plugin\_name=FORCE

告诉服务器启用该插件，但如果插件初始化失败，服务器就不会启动。换句话说，这个选项迫使服务器在启用该插件的情况下运行，或者根本就不运行。

--plugin\_name=FORCE\_PLUS\_PERMANENT

和FORCE一样，但除此之外，还可以防止该插件在运行时被卸载。如果用户试图用UNINSTALL PLUGIN这样做，会发生错误。

插件的激活状态在 INFORMATION\_SCHEMA.PLUGINS 表的 LOAD\_OPTION 列中可见。

假设CSV、BLACKHOLE和ARCHIVE是内置的可插拔存储引擎，并且你希望服务器在启动时加载它们，但要符合这些条件。如果CSV初始化失败，允许服务器运行，必须要求BLACKHOLE初始化成功，并且应该禁用ARCHIVE。为了实现这一点，在一个选项文件中使用这些行。

[mysqld］

csv=ON

blackhole=FORCE

存档=OFF

--enable-plugin\_name 选项格式是 --plugin\_name=ON 的同义词。--disable-plugin\_name和--skip-plugin\_name选项的格式是--plugin\_name=OFF的同义词。

如果一个插件被禁用，无论是显性的OFF还是隐性的，因为它被启用为ON，但未能初始化，需要该插件的服务器操作方面会发生变化。例如，如果该插件实现了一个存储引擎，那么现有的存储引擎的表将无法访问，而且试图为存储引擎创建新的表的结果是使用默认的存储引擎的表，除非启用NO\_ENGINE\_SUBSTITUTION SQL模式来导致错误发生。

禁用一个插件可能需要对其他选项进行调整。例如，如果你使用--skip-innodb启动服务器来禁用InnoDB，那么其他的innodb\_xxx选项可能也需要在启动时被省略。此外，由于InnoDB是默认的存储引擎，除非你用--default\_storage\_engine指定另一个可用的存储引擎，否则它无法启动。你还必须设置--default\_tmp\_storage\_engine。

#### 卸载插件

在运行时，UNINSTALL PLUGIN语句禁用和卸载一个服务器已知的插件。如果该插件在mysql.plugin系统表中注册，该语句将卸载该插件并将其从该表中删除。由于这个原因，UNINSTALL PLUGIN 语句需要 mysql.plugin 表的 DELETE 权限。由于该插件不再在表中注册，服务器在随后的重新启动中不会加载该插件。

UNINSTALL PLUGIN可以卸载一个插件，不管它是在运行时用INSTALL PLUGIN加载的还是在启动时用插件加载选项加载的，但要符合这些条件。

- 它不能卸载内置在服务器中的插件。这些可以被识别为那些在INFORMATION\_SCHEMA.PLUGINS或SHOW PLUGINS的输出中库名为NULL的插件。

- 它不能卸载服务器以 --plugin\_name=FORCE\_PLUS\_PERMANENT 启动的插件，这可以防止在运行时卸载插件。这些可以从 INFORMATION\_SCHEMA.PLUGINS 表的 LOAD\_OPTION 列中识别。

要卸载一个目前在服务器启动时用插件加载选项加载的插件，请使用这个程序。

1. 从my.cnf文件中删除与该插件有关的任何选项和系统变量。如果任何插件的系统变量被持久化到mysqld-auto.cnf文件中，使用RESET PERSIST var\_name对每个变量进行删除，以删除它们。

2. 2.重新启动服务器。

3. 3.插件通常是在启动时使用插件加载选项或在运行时使用INSTALL PLUGIN安装的，但不是同时安装。然而，如果在某些时候也使用了INSTALL PLUGIN，那么从my.cnf文件中删除插件的选项可能不足以卸载它。如果该插件仍然出现在 INFORMATION\_SCHEMA.PLUGINS 或 SHOW PLUGINS 的输出中，使用 UNINSTALL PLUGIN 从 mysql.plugin 表中删除它。然后再次重启服务器。

#### Plugins and Loadable Functions

A plugin when installed may also automatically install related loadable functions. If so, the plugin when uninstalled also automatically uninstalls those functions.

### 5.6.2 获取服务器插件信息

有几种方法可以确定哪些插件已经安装在服务器中。

- INFORMATION\_SCHEMA.PLUGINS表包含了每一个加载的插件的行。任何PLUGIN\_LIBRARY值为NULL的都是内置的，不能被卸载。

* mysql> **SELECT \* FROM INFORMATION\_SCHEMA.PLUGINS\G**
* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
* PLUGIN\_NAME: binlog
* PLUGIN\_VERSION: 1.0
* PLUGIN\_STATUS: ACTIVE
* PLUGIN\_TYPE: STORAGE ENGINE
* PLUGIN\_TYPE\_VERSION: 50158.0
* PLUGIN\_LIBRARY: NULL
* PLUGIN\_LIBRARY\_VERSION: NULL
* PLUGIN\_AUTHOR: Oracle Corporation
* PLUGIN\_DESCRIPTION: This is a pseudo storage engine to represent the binlog in a transaction
* PLUGIN\_LICENSE: GPL
* LOAD\_OPTION: FORCE
* ...
* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 10. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
* PLUGIN\_NAME: InnoDB
* PLUGIN\_VERSION: 1.0
* PLUGIN\_STATUS: ACTIVE
* PLUGIN\_TYPE: STORAGE ENGINE
* PLUGIN\_TYPE\_VERSION: 50158.0
* PLUGIN\_LIBRARY: ha\_innodb\_plugin.so
* PLUGIN\_LIBRARY\_VERSION: 1.0
* PLUGIN\_AUTHOR: Oracle Corporation
* PLUGIN\_DESCRIPTION: Supports transactions, row-level locking,
* and foreign keys
* PLUGIN\_LICENSE: GPL
* LOAD\_OPTION: ON
* ...
* The [**SHOW PLUGINS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-plugins) statement displays a row for each loaded plugin. Any that have a **Library** value of **NULL** are built in and cannot be unloaded.
* mysql> **SHOW PLUGINS\G**
* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
* Name: binlog
* Status: ACTIVE
* Type: STORAGE ENGINE
* Library: NULL
* License: GPL
* ...
* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 10. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
* Name: InnoDB
* Status: ACTIVE
* Type: STORAGE ENGINE
* Library: ha\_innodb\_plugin.so
* License: GPL
* ...

mysql.plugin表显示哪些插件已经用INSTALL PLUGIN注册。该表只包含插件名称和库文件名称，所以它不像PLUGINS表或SHOW PLUGINS语句那样提供很多信息。

### 5.6.3 MySQL 企业版线程池

5.6.3.1 线程池元素

5.6.3.2 安装线程池

5.6.3.3 线程池操作

5.6.3.4 线程池调整

注意

MySQL企业线程池是包含在MySQL企业版中的一个扩展，这是一个商业产品。要了解更多关于商业产品的信息，https://www.mysql.com/products/。

MySQL企业版包括MySQL企业线程池，使用一个服务器插件实现。MySQL服务器中的默认线程处理模式是使用每个客户端连接的一个线程来执行语句。随着越来越多的客户端连接到服务器并执行语句，整体性能会下降。线程池插件提供了一个替代的线程处理模型，旨在减少开销和提高性能。该插件实现了一个线程池，通过有效管理大量客户端连接的语句执行线程来提高服务器性能。

线程池解决了每个连接使用一个线程的模式的几个问题。

- 太多的线程堆栈使得CPU缓存在高度并行执行的工作负载中几乎毫无用处。线程池促进了线程堆栈的重用，以尽量减少CPU缓存的占用。

- 在太多线程并行执行的情况下，上下文切换的开销很高。这也给操作系统的调度器带来了挑战。线程池控制活动线程的数量，以使MySQL服务器内的并行性保持在它能处理的水平上，并且适合于执行MySQL的服务器主机。

- 太多的事务并行执行会增加资源争夺。在InnoDB中，这增加了持有中央互斥的时间。线程池控制交易何时开始，以确保不会有太多的交易并行执行。

#### Additional Resources

[Section A.15, “MySQL 8.0 FAQ: MySQL Enterprise Thread Pool”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\faqs.html#faqs-thread-pool)

#### 5.6.3.1 Thread Pool Elements

MySQL企业线程池包括这些要素。

- 一个插件库文件实现了线程池代码的插件，以及几个提供线程池操作信息的相关监测表。

o 从MySQL 8.0.14开始，监控表是性能模式表；见第27.12.16节，"性能模式线程池表"。

o 在MySQL 8.0.14之前，监控表是INFORMATION\_SCHEMA表；见第26.5节，"INFORMATION\_SCHEMA线程池表"。

现在，INFORMATION\_SCHEMA表已被废弃；预计它们将在未来的MySQL版本中被删除。应用程序应该从INFORMATION\_SCHEMA表过渡到Performance Schema表。例如，如果一个应用程序使用这个查询。

select \* from information\_schema.tp\_thread\_state;

应用程序应该使用这个查询来代替。

SELECT \* FROM performance\_schema.tp\_thread\_state。

- 注意

- 如果你没有加载所有的监控表，一些或所有MySQL企业监控器线程池图可能是空的。

- 关于线程池如何工作的详细描述，见第5.6.3.3节，"线程池操作"。

- 有几个系统变量与线程池有关。当服务器成功加载线程池插件时，thread\_handling系统变量的值为load-dynamically。

其他相关的系统变量是由线程池插件实现的，除非它被启用，否则不可用。有关使用这些变量的信息，请参阅第5.6.3.3节 "线程池操作 "和第5.6.3.4节 "线程池调优"。

- 性能模式有暴露线程池信息的工具，可用于调查操作性能。要识别它们，请使用这个查询。

- SELECT \* FROM performance\_schema.setup\_instruments

- WHERE NAME LIKE '%thread\_pool%';

欲了解更多信息，请参见第27章，MySQL性能模式。

#### 5.6.3.2 Thread Pool Installation

本节介绍如何安装MySQL企业线程池。有关安装插件的一般信息，请参阅第5.6.1节 "安装和卸载插件"。

为了能被服务器使用，插件库文件必须位于MySQL插件目录中（由plugin\_dir系统变量命名的目录）。如果有必要，在服务器启动时通过设置plugin\_dir的值来配置插件目录的位置。

插件库文件的基本名称是thread\_pool。每个平台的文件名后缀不同（例如，Unix和类Unix系统为.so，Windows为.dll）。

- 从MySQL 8.0.14开始的线程池安装

- 在MySQL 8.0.14之前的线程池安装

##### Thread Pool Installation as of MySQL 8.0.14

在MySQL 8.0.14及以上版本中，线程池监控表是性能模式表，与线程池插件一起加载和卸载。这些表的INFORMATION\_SCHEMA版本已被废弃，但仍然可用；它们是按照MySQL 8.0.14之前的线程池安装中的说明安装的。

要启用线程池功能，通过使用 --plugin-load-add 选项启动服务器来加载该插件。要做到这一点，在服务器的my.cnf文件中放入这些行，必要时为你的平台调整.so后缀。

[mysqld]

plugin-load-add=thread\_pool.so

To verify plugin installation, examine the [**INFORMATION\_SCHEMA.PLUGINS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-plugins-table) table or use the [**SHOW PLUGINS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-plugins) statement (see [Section 5.6.2, “Obtaining Server Plugin Information”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#obtaining-plugin-information)). For example:

mysql> **SELECT PLUGIN\_NAME, PLUGIN\_STATUS**

**FROM INFORMATION\_SCHEMA.PLUGINS**

**WHERE PLUGIN\_NAME LIKE 'thread%';**

+-----------------------+---------------+

| PLUGIN\_NAME | PLUGIN\_STATUS |

+-----------------------+---------------+

| thread\_pool | ACTIVE |

+-----------------------+---------------+

To verify that the Performance Schema monitoring tables are available, examine the [**INFORMATION\_SCHEMA.TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-tables-table) table or use the [**SHOW TABLES**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-tables) statement. For example:

mysql> **SELECT TABLE\_NAME**

**FROM INFORMATION\_SCHEMA.TABLES**

**WHERE TABLE\_SCHEMA = 'performance\_schema'**

**AND TABLE\_NAME LIKE 'tp%';**

+-----------------------+

| TABLE\_NAME |

+-----------------------+

| tp\_thread\_group\_state |

| tp\_thread\_group\_stats |

| tp\_thread\_state |

+-----------------------+

If the server loads the thread pool plugin successfully, it sets the **thread\_handling** system variable to **loaded-dynamically**.

If the plugin fails to initialize, check the server error log for diagnostic messages.

##### Thread Pool Installation Prior to MySQL 8.0.14

Prior to MySQL 8.0.14, the thread pool monitoring tables are plugins separate from the thread pool plugin and can be installed separately.

To enable thread pool capability, load the plugins to be used by starting the server with the [--plugin-load-add](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_plugin-load-add) option. For example, if you name only the plugin library file, the server loads all plugins that it contains (that is, the thread pool plugin and all the **INFORMATION\_SCHEMA** tables). To do this, put these lines in the server my.cnf file, adjusting the .so suffix for your platform as necessary:

[mysqld]

plugin-load-add=thread\_pool.so

That is equivalent to loading all thread pool plugins by naming them individually:

[mysqld]

plugin-load-add=thread\_pool=thread\_pool.so

plugin-load-add=tp\_thread\_state=thread\_pool.so

plugin-load-add=tp\_thread\_group\_state=thread\_pool.so

plugin-load-add=tp\_thread\_group\_stats=thread\_pool.so

If desired, you can load individual plugins from the library file. To load the thread pool plugin but not the **INFORMATION\_SCHEMA** tables, use an option like this:

[mysqld]

plugin-load-add=thread\_pool=thread\_pool.so

To load the thread pool plugin and only the [**TP\_THREAD\_STATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-tp-thread-state-table) **INFORMATION\_SCHEMA** table, use options like this:

[mysqld]

plugin-load-add=thread\_pool=thread\_pool.so

plugin-load-add=tp\_thread\_state=thread\_pool.so

To verify plugin installation, examine the [**INFORMATION\_SCHEMA.PLUGINS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\information-schema.html#information-schema-plugins-table) table or use the [**SHOW PLUGINS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-plugins) statement (see [Section 5.6.2, “Obtaining Server Plugin Information”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#obtaining-plugin-information)). For example:

mysql> **SELECT PLUGIN\_NAME, PLUGIN\_STATUS**

**FROM INFORMATION\_SCHEMA.PLUGINS**

**WHERE PLUGIN\_NAME LIKE 'thread%' OR PLUGIN\_NAME LIKE 'tp%';**

+-----------------------+---------------+

| PLUGIN\_NAME | PLUGIN\_STATUS |

+-----------------------+---------------+

| thread\_pool | ACTIVE |

| TP\_THREAD\_STATE | ACTIVE |

| TP\_THREAD\_GROUP\_STATE | ACTIVE |

| TP\_THREAD\_GROUP\_STATS | ACTIVE |

+-----------------------+---------------+

If the server loads the thread pool plugin successfully, it sets the **thread\_handling** system variable to **loaded-dynamically**.

If a plugin fails to initialize, check the server error log for diagnostic messages.

#### 5.6.3.3 Thread Pool Operation

线程池由一些线程组组成，每个线程组管理一组客户端连接。随着连接的建立，线程池以轮流的方式将它们分配到线程组。

线程池暴露了系统变量，可用于配置其操作。

- thread\_pool\_algorithm。用于调度的并发算法。

- thread\_pool\_high\_priority\_connection。如何安排会话的语句执行。

- thread\_pool\_max\_active\_query\_threads。每组允许多少个活动线程。

- thread\_pool\_max\_unused\_threads: 允许多少个睡眠线程。

- thread\_pool\_prio\_kickup\_timer: 线程池将等待执行的语句从低优先级队列转移到高优先级队列前的时间。

- thread\_pool\_size。线程池中线程组的数量。这是控制线程池性能的最重要参数。

- thread\_pool\_stall\_limit：正在执行的语句被认为是停滞前的时间。

要配置线程组的数量，请使用thread\_pool\_size系统变量。默认的组数是16。有关设置该变量的指南，请参见第5.6.3.4节 "线程池调优"。

每组的最大线程数是4096（或者在某些内部使用一个线程的系统上是4095）。

线程池将连接和线程分开，因此连接和执行从这些连接接收的语句的线程之间没有固定的关系。这与默认的线程处理模式不同，后者将一个线程与一个连接相关联，这样一个给定的线程就会执行来自其连接的所有语句。

默认情况下，线程池试图确保每个组在任何时候最多只有一个线程在执行，但有时也允许更多的线程临时执行以获得最佳性能。

- 每个线程组都有一个监听器线程，监听来自分配给该组的连接的传入语句。当一个语句到达时，该线程组要么立即开始执行，要么排队等待以后执行。

o 如果该语句是唯一收到的语句，并且没有语句排队或当前正在执行，则立即执行。

o 如果语句不能立即开始执行，则发生排队。

- 如果立即执行发生，监听器线程会执行它。(这意味着该组中暂时没有线程在监听。)如果语句迅速完成，执行的线程返回到监听语句。否则，线程组认为该语句停滞不前，并启动另一个线程作为监听线程（必要时创建它）。为了确保没有线程组被停滞的语句阻塞，线程池有一个后台线程，定期监控线程组状态。

通过使用监听线程来执行可以立即开始的语句，如果该语句迅速完成，就不需要再创建一个额外的线程。这确保了在并发线程数量较少的情况下，尽可能的高效执行。

当线程池插件启动时，它为每组创建一个线程（监听器线程），加上背景线程。必要时还会创建额外的线程来执行语句。

- thread\_pool\_stall\_limit系统变量的值决定了前一项中 "迅速完成 "的含义。线程被认为停滞前的默认时间是60ms，但可以设置为最大6s。这个参数是可配置的，使你能够取得适合服务器工作负载的平衡。短的等待值允许线程更快启动。短的值也更有利于避免死锁情况。长的等待值对于包括长期运行的语句的工作负载是有用的，以避免在当前语句执行时启动太多的新语句。

- 如果thread\_pool\_max\_active\_query\_threads为0，默认算法适用于刚才描述的确定每组活动线程的最大数量。默认算法将停滞的线程考虑在内，并可能暂时允许更多的活动线程。如果thread\_pool\_max\_active\_query\_threads大于0，它就对每组的活动线程数量进行了限制。

- 线程池的重点是限制并发的短时运行的语句数量。在一个正在执行的语句达到停顿时间之前，它阻止其他语句开始执行。如果该语句的执行时间超过了停顿时间，它就被允许继续执行，但不再阻止其他语句的开始。通过这种方式，线程池试图确保在每个线程组中，永远不会有超过一个短期运行的语句，尽管可能有多个长期运行的语句。让长期运行的语句阻止其他语句的执行是不可取的，因为对可能需要的等待量没有限制。例如，在一个复制源服务器上，一个正在向复制体发送二进制日志事件的线程实际上是永远运行的。

- 如果一个语句遇到磁盘I/O操作或用户级别的锁（行锁或表锁），它就会被阻塞。该阻塞会导致线程组变得未使用，所以有回调到线程池，以确保线程池可以立即在该组中启动一个新的线程来执行另一条语句。当一个被阻塞的线程返回时，线程池允许它立即重新启动。

- 有两个队列，一个高优先级的队列和一个低优先级的队列。事务中的第一条语句会进入低优先级队列。如果该事务正在进行（该事务的语句已经开始执行），则该事务的任何后续语句将进入高优先级队列，否则将进入低优先级队列。队列分配可以通过启用thread\_pool\_high\_priority\_connection系统变量来影响，该变量导致会话的所有排队语句进入高优先级队列。

非交易型存储引擎的语句，或者交易型引擎（如果启用了自动提交）的语句，被视为低优先级的语句，因为在这种情况下，每个语句都是一个交易。因此，给定InnoDB和MyISAM表的混合语句，线程池将InnoDB的语句优先于MyISAM的语句，除非启用自动提交。启用自动提交后，所有语句的优先级都很低。

- 当线程组选择一个排队的语句来执行时，它首先在高优先级队列中寻找，然后在低优先级队列中寻找。如果找到了一个语句，它就会从其队列中移除并开始执行。

- 如果一条语句在低优先级队列中停留时间过长，线程池就会移到高优先级队列中。thread\_pool\_prio\_kickup\_timer系统变量的值控制移动前的时间。对于每个线程组，每10ms（每秒100条）最多有一条语句从低优先级队列移到高优先级队列。

- 线程池重用最活跃的线程，以获得对CPU缓存更好的利用。这是一个小小的调整，对性能有很大的影响。

- 当线程执行来自用户连接的语句时，Performance Schema工具将线程活动记入用户连接。否则，Performance Schema将活动记入线程池。

下面是一个线程组可能有多个线程开始执行语句的条件的例子。

- 一个线程开始执行一个语句，但运行时间足够长，被认为是停滞不前。该线程组允许另一个线程开始执行另一条语句，即使第一个线程仍在执行。

- 一个线程开始执行一条语句，然后变得阻塞，并将此报告给线程池。线程组允许另一个线程开始执行另一条语句。

- 一个线程开始执行一条语句，变得阻塞，但没有报告它被阻塞了，因为该阻塞没有发生在已被线程池回调工具化的代码中。在这种情况下，该线程在线程组看来仍在运行。如果区块持续的时间足够长，以至于语句被认为是停滞的，那么该组允许另一个线程开始执行另一个语句。

线程池被设计为可在越来越多的连接中进行扩展。它还被设计用来避免因限制主动执行的语句数量而可能产生的死锁。重要的是，不向线程池报告的线程不会阻止其他语句的执行，从而导致线程池出现死锁。这类语句的例子如下。

- 长时间运行的语句。这些会导致所有的资源只被少数语句使用，它们可能会阻止所有其他语句访问服务器。

- 读取二进制日志并将其发送到副本的二进制日志转储线程。这是一种长期运行的 "语句"，运行时间非常长，不应该阻止其他语句的执行。

- 在行锁、表锁、睡眠或任何其他未被MySQL Server或存储引擎报告回线程池的阻塞活动中阻塞的语句。

在每一种情况下，为了防止死锁，当语句不能迅速完成时，就将其移到停滞类别，以便线程组可以允许另一个语句开始执行。通过这种设计，当一个线程执行或被阻断的时间延长时，线程组会将该线程移至停滞类别，在语句执行的剩余时间内，它不会阻止其他语句的执行。

可能出现的最大线程数是max\_connections和thread\_pool\_size之和。这可能发生在所有连接都处于执行模式的情况下，每组创建一个额外的线程来监听更多的语句。这种状态不一定经常发生，但理论上是可能的。

#### 5.6.3.4 Thread Pool Tuning

本节提供了关于设置线程池系统变量的指南，以获得最佳性能，使用每秒交易量等指标来衡量。

thread\_pool\_size是控制线程池性能的最重要参数。它只能在服务器启动时设置。我们测试线程池的经验表明如下。

- 如果主存储引擎是InnoDB，最佳线程池大小设置可能在16到36之间，最常见的最佳值倾向于24到36。我们还没有看到任何情况下的最佳设置超过36。可能有一些特殊情况，小于16的值是最佳的。

对于DBT2和Sysbench这样的工作负载，InnoDB的最佳值似乎通常在36左右。对于非常写密集型的工作负载，最佳设置有时可能更低。

- 如果主要的存储引擎是MyISAM，线程池大小的设置应该相当低。最佳的性能通常是在4到8之间。更高的值往往会对性能产生轻微的负面影响，但不会产生巨大的影响。

另一个系统变量thread\_pool\_stall\_limit对于处理阻塞的和长时间运行的语句很重要。如果所有阻塞MySQL服务器的调用都报告给线程池，那么它就会一直知道执行线程被阻塞的情况。然而，这可能并不总是真的。例如，阻塞可能发生在没有用线程池回调来检测的代码中。对于这种情况，线程池必须能够识别那些看起来被阻塞的线程。这是通过超时来实现的，可以使用thread\_pool\_stall\_limit系统变量进行调整，其值以10ms为单位。这个参数确保服务器不会完全被阻塞。thread\_pool\_stall\_limit的值的上限为6秒，以防止出现服务器死锁的风险。

thread\_pool\_stall\_limit还使线程池能够处理长运行的语句。如果允许一个长期运行的语句阻塞一个线程组，分配给该组的所有其他连接将被阻塞，无法开始执行，直到长期运行的语句完成。在最坏的情况下，这可能需要几个小时甚至几天。

thread\_pool\_stall\_limit的值应选择为：执行时间超过其值的语句被视为停滞。停滞的语句会产生很多额外的开销，因为它们涉及额外的上下文切换，在某些情况下甚至涉及额外的线程创建。另一方面，将thread\_pool\_stall\_limit参数设置得过高，意味着长运行的语句会阻塞一些短运行的语句，时间超过必要的范围。短的等待值允许线程更快启动。短的值也更有利于避免死锁情况。长等待值对包括长运行语句的工作负载很有用，可以避免在当前语句执行时启动太多的新语句。

假设一台服务器执行的工作负载中，99.9%的语句在100ms内完成，即使服务器被加载，剩下的语句也是在100ms和2小时之间相当均匀地分布。在这种情况下，将thread\_pool\_stall\_limit设置为10（10×10ms=100ms）是合理的。默认值6（60ms）适用于主要执行非常简单的语句的服务器。

thread\_pool\_stall\_limit参数可以在运行时改变，使你能够取得适合服务器工作负载的平衡。假设tp\_thread\_group\_stats表已经启用，你可以使用下面的查询来确定执行的语句中停滞的部分。

select sum(stalled\_queries\_executed) / sum(query\_executed)

FROM performance\_schema.tp\_thread\_group\_stats。

这个数字应该尽可能的低。为了减少语句停滞的可能性，增加thread\_pool\_stall\_limit的值。

当一个语句到达时，在它真正开始执行之前，它可以被延迟的最大时间是多少？假设以下条件适用。

- 有200条语句在低优先级队列中排队。

- 高优先级队列中有10条语句在排队。

- thread\_pool\_prio\_kickup\_timer被设置为10000（10秒）。

- thread\_pool\_stall\_limit被设置为100（1秒）。

在最坏的情况下，10个高优先级的语句代表了10个持续执行了很长时间的事务。因此，在最坏的情况下，没有语句可以被移到高优先级队列中，因为它总是已经包含了等待执行的语句。10秒后，新语句有资格被移到高优先级队列中。然而，在它被移动之前，它之前的所有语句也必须被移动。这可能又需要2秒钟，因为每秒最多只能有100条语句被移到高优先级队列中。现在，当语句到达高优先级队列时，在它前面可能有许多长期运行的语句。在最坏的情况下，每一条都会变得停滞不前，在下一条语句从高优先级队列中被检索出来之前，每条语句都需要1秒钟。因此，在这种情况下，需要222秒才能开始执行新的语句。

这个例子显示了一个应用程序的最坏情况。如何处理它取决于应用程序。如果应用程序对响应时间有很高的要求，它很可能应该自己在更高的级别上对用户进行节流。否则，它可以使用线程池配置参数来设置某种最大等待时间。

### 5.6.4  Rewriter Query Rewrite 插件

5.6.4.1 安装或卸载 Rewriter Query Rewrite 插件

5.6.4.2 使用复写器查询复写插件

5.6.4.3 复写器查询复写插件参考

MySQL支持查询重写插件，它可以在服务器执行之前检查并可能修改服务器收到的SQL语句。参见查询重写插件。

MySQL发行版包括一个名为Rewriter的后解析查询重写插件和安装该插件及其相关元素的脚本。这些元素一起工作以提供语句重写能力。

- 一个名为Rewriter的服务器端插件检查语句并可能根据其内存中的重写规则重写它们。

- 这些语句是可以被重写的。

o 从MySQL 8.0.12开始：SELECT、INSERT、REPLACE、UPDATE和DELETE。

o 在MySQL 8.0.12之前：只有SELECT。

独立的语句和准备好的语句都要被改写。发生在视图定义或存储程序中的语句不受重写影响。

- 重写插件使用一个名为query\_rewrite的数据库，包含一个名为rewrite\_rules的表。该表为该插件用来决定是否重写语句的规则提供了持久的存储。用户通过修改存储在该表中的规则集来与该插件进行交流。插件通过设置表行的消息列与用户进行沟通。

- query\_rewrite数据库包含一个名为flush\_rewrite\_rules()的存储过程，将规则表的内容加载到插件中。

- 一个名为load\_rewrite\_rules()的可加载函数被flush\_rewrite\_rules()存储过程使用。

- Rewriter插件暴露了系统变量，使插件配置和状态变量提供运行时的操作信息。

下面的章节描述了如何安装和使用Rewriter插件，并提供了其相关元素的参考信息。

#### 5.6.4.1安装和卸载 Rewriter Query Rewrite 插件

注意事项

如果安装了Rewriter插件，即使在禁用的情况下也会产生一些开销。为了避免这种开销，除非你打算使用它，否则不要安装该插件。

要安装或卸载Rewriter查询重写插件，请选择位于MySQL安装的共享目录下的适当脚本。

- install\_rewriter.sql。选择这个脚本来安装Rewriter插件和它的相关元素。

- uninstall\_rewriter.sql。选择这个脚本来卸载 Rewriter 插件及其相关元素。

运行所选择的脚本，如下所示。

shell> **mysql -u root -p < install\_rewriter.sql**

Enter password: ***(enter root password here)***

The example here uses the install\_rewriter.sql installation script. Substitute uninstall\_rewriter.sql if you are uninstalling the plugin.

Running an installation script should install and enable the plugin. To verify that, connect to the server and execute this statement:

mysql> **SHOW GLOBAL VARIABLES LIKE 'rewriter\_enabled';**

+------------------+-------+

| Variable\_name | Value |

+------------------+-------+

| rewriter\_enabled | ON |

+------------------+-------+

For usage instructions, see [Section 5.6.4.2, “Using the Rewriter Query Rewrite Plugin”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#rewriter-query-rewrite-plugin-usage). For reference information, see [Section 5.6.4.3, “Rewriter Query Rewrite Plugin Reference”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#rewriter-query-rewrite-plugin-reference).

#### 5.6.4.2 Using the Rewriter Query Rewrite Plugin

要启用或停用该插件，请启用或停用rewriter\_enabled系统变量。默认情况下，当你安装Rewriter插件时，它是被启用的（参见5.6.4.1节，"安装或卸载Rewriter查询重写插件"）。要明确地设置插件的初始状态，你可以在服务器启动时设置这个变量。例如，要在选项文件中启用该插件，请使用这些行。

[mysqld]

rewriter\_enabled=ON

It is also possible to enable or disable the plugin at runtime:

SET GLOBAL rewriter\_enabled = ON;

SET GLOBAL rewriter\_enabled = OFF;

假设Rewriter插件被启用，它检查并可能修改服务器收到的每个可重写语句。该插件根据其内存中的重写规则缓存来决定是否重写语句，这些规则是从query\_rewrite数据库的rewrite\_rules表中加载的。

这些语句会被重写。

- 从MySQL 8.0.12开始：SELECT、INSERT、REPLACE、UPDATE和DELETE。

- 在MySQL 8.0.12之前：只有SELECT。

独立的语句和准备好的语句都要被重写。发生在视图定义或存储程序中的语句不受重写影响。

- 添加重写规则

- 语句匹配如何工作

- 重写准备好的语句

- 重写器插件的操作信息

- 重写器插件对字符集的使用

##### Adding Rewrite Rules

要为Rewriter插件添加规则，需要向rewrite\_rules表添加行，然后调用flush\_rewrite\_rules()存储过程，将规则从表中加载到插件中。下面的例子创建了一个简单的规则来匹配选择单一字面值的语句。

INSERT INTO query\_rewrite.rewrite\_rules (pattern, replacement)

VALUES('SELECT ?', 'SELECT ? + 1');

The resulting table contents look like this:

mysql> **SELECT \* FROM query\_rewrite.rewrite\_rules\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

id: 1

pattern: SELECT ?

pattern\_database: NULL

replacement: SELECT ? + 1

enabled: YES

message: NULL

pattern\_digest: NULL

normalized\_pattern: NULL

该规则指定了一个模式模板，表示要匹配哪些SELECT语句，以及一个替换模板，表示如何重写匹配的语句。然而，将规则添加到rewrite\_rules表中，并不足以使Rewriter插件使用该规则。你必须调用flush\_rewrite\_rules()来将表的内容加载到插件的内存缓存中。

mysql> **CALL query\_rewrite.flush\_rewrite\_rules();**

Tip

如果你的重写规则似乎不能正常工作，请确保你已经通过调用flush\_rewrite\_rules()重新加载了规则表。

当该插件从规则表中读取每个规则时，它从模式和摘要值中计算出一个规范化（语句摘要）形式，并使用它们来更新规范化\_模式和模式\_摘要列。

mysql> **SELECT \* FROM query\_rewrite.rewrite\_rules\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

id: 1

pattern: SELECT ?

pattern\_database: NULL

replacement: SELECT ? + 1

enabled: YES

message: NULL

pattern\_digest: d1b44b0c19af710b5a679907e284acd2ddc285201794bc69a2389d77baedddae

normalized\_pattern: select ?

For information about statement digesting, normalized statements, and digest hash values, see [Section 27.10, “Performance Schema Statement Digests and Sampling”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-statement-digests).

If a rule cannot be loaded due to some error, calling **flush\_rewrite\_rules()** produces an error:

mysql> **CALL query\_rewrite.flush\_rewrite\_rules();**

ERROR 1644 (45000): Loading of some rule(s) failed.

当这种情况发生时，该插件会在规则行的消息列中写入一条错误信息，以沟通问题。检查rewrite\_rules表中具有非NULL消息列值的行，看看存在什么问题。

模式使用与准备好的语句相同的语法（参见第13.5.1节，"PREPARE语句"）。在一个模式模板中，? 字符作为参数标记，与数据值相匹配。参数标记只能用在应该出现数据值的地方，不能用于SQL关键字、标识符等。？"字符不应包含在引号内。

和模式一样，替换可以包含? 对于与模式模板相匹配的语句，该插件会重写它，用模式中相应的标记所匹配的数据值来替换替换中的 ? 参数标记。其结果是一个完整的语句字符串。该插件要求服务器对其进行解析，并将结果返回给服务器，作为重写的语句的表示。

在添加和加载规则后，根据语句是否与规则模式匹配，检查是否发生重写。

mysql> **SELECT PI();**

+----------+

| PI() |

+----------+

| 3.141593 |

+----------+

1 row in set (0.01 sec)

mysql> **SELECT 10;**

+--------+

| 10 + 1 |

+--------+

| 11 |

+--------+

1 row in set, 1 warning (0.00 sec)

No rewriting occurs for the first [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statement, but does for the second. The second statement illustrates that when the **Rewriter** plugin rewrites a statement, it produces a warning message. To view the message, use [**SHOW WARNINGS**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#show-warnings):

mysql> **SHOW WARNINGS\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Level: Note

Code: 1105

Message: Query 'SELECT 10' rewritten to 'SELECT 10 + 1' by a query rewrite plugin

A statement need not be rewritten to a statement of the same type. The following example loads a rule that rewrites [**DELETE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#delete) statements to [**UPDATE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#update) statements:

INSERT INTO query\_rewrite.rewrite\_rules (pattern, replacement)

VALUES('DELETE FROM db1.t1 WHERE col = ?',

'UPDATE db1.t1 SET col = NULL WHERE col = ?');

CALL query\_rewrite.flush\_rewrite\_rules();

To enable or disable an existing rule, modify its **enabled** column and reload the table into the plugin. To disable rule 1:

UPDATE query\_rewrite.rewrite\_rules SET enabled = 'NO' WHERE id = 1;

CALL query\_rewrite.flush\_rewrite\_rules();

This enables you to deactivate a rule without removing it from the table.

To re-enable rule 1:

UPDATE query\_rewrite.rewrite\_rules SET enabled = 'YES' WHERE id = 1;

CALL query\_rewrite.flush\_rewrite\_rules();

The **rewrite\_rules** table contains a **pattern\_database** column that **Rewriter** uses for matching table names that are not qualified with a database name:

* Qualified table names in statements match qualified names in the pattern if corresponding database and table names are identical.
* Unqualified table names in statements match unqualified names in the pattern only if the default database is the same as **pattern\_database** and the table names are identical.

Suppose that a table named **appdb.users** has a column named **id** and that applications are expected to select rows from the table using a query of one of these forms, where the second can be used only if **appdb** is the default database:

SELECT \* FROM users WHERE appdb.id = ***id\_value***;

SELECT \* FROM users WHERE id = ***id\_value***;

Suppose also that the **id** column is renamed to **user\_id** (perhaps the table must be modified to add another type of ID and it is necessary to indicate more specifically what type of ID the **id** column represents).

The change means that applications must refer to **user\_id** rather than **id** in the **WHERE** clause. But if there are old applications that cannot be written to change the **SELECT** queries they generate, they no longer work properly. The **Rewriter** plugin can solve this problem. To match and rewrite statements whether or not they qualify the table name, add the following two rules and reload the rules table:

INSERT INTO query\_rewrite.rewrite\_rules

(pattern, replacement) VALUES(

'SELECT \* FROM appdb.users WHERE id = ?',

'SELECT \* FROM appdb.users WHERE user\_id = ?'

);

INSERT INTO query\_rewrite.rewrite\_rules

(pattern, replacement, pattern\_database) VALUES(

'SELECT \* FROM users WHERE id = ?',

'SELECT \* FROM users WHERE user\_id = ?',

'appdb'

);

CALL query\_rewrite.flush\_rewrite\_rules();

**Rewriter** uses the first rule to match statements that use the qualified table name. It uses the second to match statements that used the unqualified name, but only if the default database is **appdb** (the value in **pattern\_database**).

##### How Statement Matching Works

The **Rewriter** plugin uses statement digests and digest hash values to match incoming statements against rewrite rules in stages. The **max\_digest\_length** system variable determines the size of the buffer used for computing statement digests. Larger values enable computation of digests that distinguish longer statements. Smaller values use less memory but increase the likelihood of longer statements colliding with the same digest value.

The plugin matches each statement to the rewrite rules as follows:

1. Compute the statement digest hash value and compare it to the rule digest hash values. This is subject to false positives, but serves as a quick rejection test.
2. If the statement digest hash value matches any pattern digest hash values, match the normalized (statement digest) form of the statement to the normalized form of the matching rule patterns.
3. If the normalized statement matches a rule, compare the literal values in the statement and the pattern. A **?** character in the pattern matches any literal value in the statement. If the statement prepares a statement, **?** in the pattern also matches **?** in the statement. Otherwise, corresponding literals must be the same.

If multiple rules match a statement, it is nondeterministic which one the plugin uses to rewrite the statement.

If a pattern contains more markers than the replacement, the plugin discards excess data values. If a pattern contains fewer markers than the replacement, it is an error. The plugin notices this when the rules table is loaded, writes an error message to the **message** column of the rule row to communicate the problem, and sets the **[Rewriter\_reload\_error](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "statvar_Rewriter_reload_error)** status variable to **ON**.

##### Rewriting Prepared Statements

Prepared statements are rewritten at parse time (that is, when they are prepared), not when they are executed later.

Prepared statements differ from nonprepared statements in that they may contain **?** characters as parameter markers. To match a **?** in a prepared statement, a **Rewriter** pattern must contain **?** in the same location. Suppose that a rewrite rule has this pattern:

SELECT ?, 3

The following table shows several prepared [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements and whether the rule pattern matches them.

| **Prepared Statement** | **Whether Pattern Matches Statement** |
| --- | --- |
| **PREPARE s AS 'SELECT 3, 3'** | Yes |
| **PREPARE s AS 'SELECT ?, 3'** | Yes |
| **PREPARE s AS 'SELECT 3, ?'** | No |
| **PREPARE s AS 'SELECT ?, ?'** | No |

##### Rewriter Plugin Operational Information

The **Rewriter** plugin makes information available about its operation by means of several status variables:

mysql> **SHOW GLOBAL STATUS LIKE 'Rewriter%';**

+-----------------------------------+-------+

| Variable\_name | Value |

+-----------------------------------+-------+

| Rewriter\_number\_loaded\_rules | 1 |

| Rewriter\_number\_reloads | 5 |

| Rewriter\_number\_rewritten\_queries | 1 |

| Rewriter\_reload\_error | ON |

+-----------------------------------+-------+

For descriptions of these variables, see [Section 5.6.4.3.4, “Rewriter Query Rewrite Plugin Status Variables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#rewriter-query-rewrite-plugin-status-variables).

When you load the rules table by calling the **flush\_rewrite\_rules()** stored procedure, if an error occurs for some rule, the **CALL** statement produces an error, and the plugin sets the **Rewriter\_reload\_error** status variable to **ON**:

mysql> **CALL query\_rewrite.flush\_rewrite\_rules();**

ERROR 1644 (45000): Loading of some rule(s) failed.

mysql> **SHOW GLOBAL STATUS LIKE 'Rewriter\_reload\_error';**

+-----------------------+-------+

| Variable\_name | Value |

+-----------------------+-------+

| Rewriter\_reload\_error | ON |

+-----------------------+-------+

In this case, check the **rewrite\_rules** table for rows with non-**NULL** **message** column values to see what problems exist.

##### Rewriter Plugin Use of Character Sets

When the **rewrite\_rules** table is loaded into the **Rewriter** plugin, the plugin interprets statements using the current global value of the **[character\_set\_client](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_client)** system variable. If the global **[character\_set\_client](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_client)** value is changed subsequently, the rules table must be reloaded.

A client must have a session **[character\_set\_client](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_character_set_client)** value identical to what the global value was when the rules table was loaded or rule matching does not work for that client.

#### 5.6.4.3 Rewriter Query Rewrite Plugin Reference

The following discussion serves as a reference to these elements associated with the **Rewriter** query rewrite plugin:

* The **Rewriter** rules table in the **query\_rewrite** database
* **Rewriter** procedures and functions
* **Rewriter** system and status variables

##### 5.6.4.3.1 Rewriter Query Rewrite Plugin Rules Table

query\_rewrite数据库中的rewrite\_rules表为Rewriter插件用来决定是否重写语句的规则提供了持久的存储。

用户通过修改存储在这个表中的规则集与插件进行交流。该插件通过设置该表的消息列来与用户进行信息交流。

注意

规则表是由存储过程flush\_rewrite\_rules加载到插件中的。除非该存储过程在最近一次修改表后被调用，否则表的内容不一定与插件正在使用的规则集一致。

rewrite\_rules表有这些列。

- id

规则的ID。该列是表的主键。你可以使用这个ID来唯一地识别任何规则。

- 模式

表示规则匹配的语句模式的模板。使用? 来表示匹配数据值的参数标记。

- pattern\_database

用于匹配语句中未限定的表名的数据库。如果对应的数据库和表名相同，那么语句中的合格表名与模式中的合格表名匹配。只有当默认数据库与pattern\_database相同并且表名相同时，语句中的非限定表名才与模式中的非限定表名匹配。

- 替换

表示如何重写与模式列值匹配的语句的模板。使用? 表示匹配数据值的参数标记。在重写的语句中，插件使用pattern中相应标记匹配的数据值替换替换中的?

- 启用

该规则是否被启用。只有当这一列是YES时，加载操作（通过调用flush\_rewrite\_rules()存储过程执行）才会将规则从表中加载到Rewriter内存缓存中。

这一列使得停用一个规则而不删除它成为可能。将该列设置为YES以外的值，并将该表重新加载到插件中。

- 信息

插件使用这一列与用户进行交流。如果在规则表被加载到内存中时没有发生错误，插件会将消息列设置为NULL。非NULL值表示有错误，该列内容为错误信息。在这些情况下会发生错误。

o 模式或替换是一个不正确的SQL语句，产生语法错误。

o 替换包含比模式更多的？参数标记。

如果发生加载错误，该插件也将Rewriter\_reload\_error状态变量设置为ON。

- pattern\_digest

该列用于调试和诊断。如果该列在规则表加载到内存时存在，插件会用模式摘要更新它。如果你想确定为什么某些语句不能被重写，这一列可能很有用。

- 正常化模式

这一列是用来调试和诊断的。如果该列在规则表加载到内存时存在，插件会用模式的规范化形式更新它。如果你想确定为什么某些语句不能被重写，这一列可能很有用。

5.6.4.3.2 Rewriter Query Rewrite Plugin Procedures and Functions

重写器插件操作使用一个存储过程，将规则表加载到其内存缓存中，并使用一个可加载的辅助函数。在正常操作下，用户只调用存储过程。该函数旨在由存储过程调用，而不是由用户直接调用。

- flush\_rewrite\_rules()

这个存储过程使用load\_rewrite\_rules()函数将rewrite\_rules表的内容加载到Rewriter内存缓存中。

调用flush\_rewrite\_rules()意味着COMMIT。

在你修改规则表后调用这个过程，使插件根据新的表内容更新其缓存。如果有任何错误发生，该插件将为表中相应的规则行设置消息列，并将Rewriter\_reload\_error状态变量设置为ON。

- load\_rewrite\_rules()

这个函数是一个辅助例程，由flush\_rewrite\_rules()存储过程使用。

##### 5.6.4.3.3 Rewriter Query Rewrite Plugin System Variables

The **Rewriter** query rewrite plugin supports the following system variables. These variables are available only if the plugin is installed (see [Section 5.6.4.1, “Installing or Uninstalling the Rewriter Query Rewrite Plugin”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#rewriter-query-rewrite-plugin-installation)).

* **[rewriter\_enabled](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_rewriter_enabled)**

|  |  |
| --- | --- |
| **System Variable** | [**rewriter\_enabled**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rewriter_enabled) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* Whether the **Rewriter** query rewrite plugin is enabled.

* **[rewriter\_verbose](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_rewriter_verbose)**

|  |  |
| --- | --- |
| **System Variable** | [**rewriter\_verbose**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_rewriter_verbose) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |

* For internal use.

##### 5.6.4.3.4 Rewriter Query Rewrite Plugin Status Variables

Rewriter查询重写插件支持以下状态变量。这些变量只有在安装了该插件后才能使用（见第5.6.4.1节，"安装或卸载Rewriter查询重写插件"）。

- Rewriter\_number\_loaded\_rules

从rewrite\_rules表中成功加载到内存中供Rewriter插件使用的重写插件重写规则的数量。

- Rewriter\_number\_reloads

rewrite\_rules表被加载到Rewriter插件使用的内存缓存中的次数。

- Rewriter\_number\_rewritten\_queries（重写次数）。

自Rewriter查询重写插件被加载以来，它所重写的查询数量。

- Rewriter\_reload\_error

在最近一次将rewrite\_rules表加载到Rewriter插件使用的内存缓存中时，是否发生了错误。如果该值为OFF，则没有发生错误。如果该值为ON，则发生了错误；检查rewriter\_rules表中的错误信息列。

### 5.6.5  ddl\_rewriter 插件

5.6.5.1 安装或卸载ddl\_rewriter

5.6.5.2 ddl\_rewriter插件选项

MySQL 8.0.16及更高版本包括一个ddl\_rewriter插件，它可以在服务器解析和执行CREATE TABLE语句之前，对其进行修改。该插件删除了ENCRYPTION、DATA DIRECTORY和INDEX DIRECTORY子句，这在从SQL转储文件中恢复表时可能很有帮助，该文件是由加密的数据库或将其表存储在数据目录之外的数据库创建。例如，该插件可以将这种转储文件恢复到一个未加密的实例中，或者在一个无法访问数据目录外的路径的环境中。

在使用ddl\_rewriter插件之前，请根据第5.6.5.1节 "安装或卸载ddl\_rewriter "中提供的说明安装它。

ddl\_rewriter在解析之前检查服务器收到的SQL语句，根据这些条件重写它们。

- ddl\_rewriter只考虑CREATE TABLE语句，而且只有当它们是出现在输入行的开头或准备好的语句文本的开头的独立语句。语句可以延伸到多行。

- 在考虑重写的语句中，以下条款的实例被重写，每个实例被一个空格所取代。

o ENCRYPTION

o DATA DIRECTORY (在表和分区级别)

o INDEX DIRECTORY（在表和分区级别）。

- 重写并不取决于字母大小写。

如果ddl\_rewriter重写了一条语句，它会产生一个警告。

mysql> **CREATE TABLE t (i INT) DATA DIRECTORY '/var/mysql/data';**

Query OK, 0 rows affected, 1 warning (0.03 sec)

mysql> **SHOW WARNINGS\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Level: Note

Code: 1105

Message: Query 'CREATE TABLE t (i INT) DATA DIRECTORY '/var/mysql/data''

rewritten to 'CREATE TABLE t (i INT) ' by a query rewrite plugin

1 row in set (0.00 sec)

如果一般的查询日志或二进制日志被启用，服务器会在ddl\_rewriter重写后将语句写入其中。

当安装时，ddl\_rewriter会暴露Performance Schema memory/rewriter/ddl\_rewriter工具，用于跟踪插件的内存使用。参见第27.12.20.10节，"内存汇总表"

5.6.5.1安装和卸载 ddl\_rewriter

本节描述了如何安装或卸载ddl\_rewriter插件。关于安装插件的一般信息，见第5.6.1节，"安装和卸载插件"。

注意

如果安装了ddl\_rewriter插件，即使在禁用的情况下也会涉及一些最小的开销。为了避免这种开销，只在你打算使用它的时候安装ddl\_rewriter。

主要的使用情况是修改从转储文件中恢复的语句，所以典型的使用模式是：1）安装该插件；2）恢复转储文件；3）卸载该插件。

为了能被服务器使用，插件库文件必须位于MySQL插件目录中（由plugin\_dir系统变量命名的目录）。如果有必要，通过在服务器启动时设置plugin\_dir的值来配置插件目录的位置。

插件库文件的基本名称是ddl\_rewriter。每个平台的文件名后缀不同（例如，Unix和类Unix系统为.so，Windows为.dll）。

要安装ddl\_rewriter插件，使用INSTALL PLUGIN语句，根据需要为你的平台调整.so后缀。

mysql> **SELECT PLUGIN\_NAME, PLUGIN\_STATUS, PLUGIN\_TYPE**

**FROM INFORMATION\_SCHEMA.PLUGINS**

**WHERE PLUGIN\_NAME LIKE 'ddl%';**

+--------------+---------------+-------------+

| PLUGIN\_NAME | PLUGIN\_STATUS | PLUGIN\_TYPE |

+--------------+---------------+-------------+

| ddl\_rewriter | ACTIVE | AUDIT |

+--------------+---------------+-------------+

正如前面的结果所示，ddl\_rewriter被实现为一个审计插件。

如果该插件初始化失败，请检查服务器错误日志中的诊断信息。

一旦按照刚才描述的方式安装，ddl\_rewriter就会一直安装，直到被卸载。要移除它，使用 UNINSTALL PLUGIN。

UNINSTALL PLUGIN ddl\_rewriter;

If **ddl\_rewriter** is installed, you can use the [--ddl-rewriter](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ddl-rewriter) option for subsequent server startups to control **ddl\_rewriter** plugin activation. For example, to prevent the plugin from being enabled at runtime, use this option:

[mysqld]

ddl-rewriter=OFF

#### 5.6.5.2 ddl\_rewriter Plugin Options

本节描述了控制ddl\_rewriter插件操作的命令选项。如果在启动时指定的值不正确，ddl\_rewriter插件可能无法正常初始化，服务器不会加载它。

要控制ddl\_rewriter插件的激活，请使用该选项

* [--ddl-rewriter[=***value***]](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_ddl-rewriter)

|  |  |
| --- | --- |
| **Command-Line Format** | **--ddl-rewriter[=value]** |
| **Introduced** | 8.0.16 |
| **Type** | Enumeration |
| **Default Value** | **ON** |
| **Valid Values** | **ON**  **OFF**  **FORCE**  **FORCE\_PLUS\_PERMANENT** |

- 这个选项控制服务器在启动时如何加载ddl\_rewriter插件。只有当该插件先前已经用INSTALL PLUGIN注册，或者用--plugin-load或--plugin-load-add加载时，它才可用。参见第5.6.5.1节，"安装或卸载ddl\_rewriter"。

- 选项值应该是那些可用于插件加载的选项之一，如第5.6.1节 "安装和卸载插件 "中所述。例如， --ddl-rewriter=OFF 在服务器启动时禁用该插件。

### 5.6.6 Version Tokens插件

5.6.6.1 版本令牌元素

5.6.6.2 安装或卸载版本令牌

5.6.6.3 使用版本令牌

5.6.6.4 版本令牌参考

MySQL包括版本令牌，该功能可以创建和同步服务器令牌，应用程序可以用它来防止访问不正确或过时的数据。

版本令牌接口有这些特点。

- 版本令牌是由一个作为键或标识符的名称和一个值组成的对。

- 版本令牌可以被锁定。一个应用程序可以使用令牌锁来向其他合作的应用程序表明，令牌正在使用中，不应该被修改。

- 版本令牌列表是按服务器建立的（例如，指定服务器的分配或运行状态）。此外，一个与服务器通信的应用程序可以注册它自己的令牌列表，表明它要求服务器处于的状态。应用程序向不处于所需状态的服务器发送的SQL语句会产生一个错误。这是给应用程序的一个信号，它应该寻找一个处于所需状态的不同服务器来接收SQL语句。

下面几节描述了版本令牌的元素，讨论了如何安装和使用它，并提供了其元素的参考信息。

5.6.6.1 Version Tokens 元素

版本令牌是基于一个实现这些元素的插件库。

- 一个名为version\_tokens的服务器端插件持有与服务器相关的版本令牌列表，并订阅语句执行事件的通知。version\_tokens插件使用审计插件API来监控来自客户端的传入语句，并将每个客户端的特定会话版本令牌列表与服务器版本令牌列表进行匹配。如果有一个匹配，该插件让语句通过，服务器继续处理它。否则，该插件会向客户返回一个错误，声明就会失败。

- 一组可加载的函数提供了一个SQL级别的API，用于操作和检查由该插件维护的服务器版本令牌列表。调用任何一个版本令牌函数都需要VERSION\_TOKEN\_ADMIN权限（或已废弃的SUPER权限）。

- 当version\_tokens插件加载时，它定义了VERSION\_TOKEN\_ADMIN动态权限。这个权限可以被授予函数的用户。

- 一个系统变量使客户能够指定注册所需服务器状态的版本令牌的列表。如果客户端发送语句时服务器有不同的状态，客户端会收到一个错误。

#### 5.6.6.2 安装和卸载 Version Tokens

注意事项

如果安装，版本令牌涉及一些开销。为了避免这种开销，除非你打算使用它，否则不要安装它。

本节描述了如何安装或卸载版本令牌，它是通过一个包含插件和可加载函数的插件库文件实现的。关于安装或卸载插件和可加载函数的一般信息，请参阅第5.6.1节，"安装和卸载插件"，以及第5.7.1节，"安装和卸载可加载函数"。

为了能被服务器使用，插件库文件必须位于MySQL插件目录中（由plugin\_dir系统变量命名的目录）。如果需要，在服务器启动时通过设置plugin\_dir的值来配置插件目录的位置。

插件库文件的基本名称是version\_tokens。每个平台的文件名后缀不同（例如，Unix和类Unix系统为.so，Windows为.dll）。

要安装版本代号插件和函数，使用INSTALL PLUGIN和CREATE FUNCTION语句，必要时为你的平台调整.so后缀。

INSTALL PLUGIN version\_tokens SONAME 'version\_token.so';

CREATE FUNCTION version\_tokens\_set RETURNS STRING

SONAME 'version\_token.so';

CREATE FUNCTION version\_tokens\_show RETURNS STRING

SONAME 'version\_token.so';

CREATE FUNCTION version\_tokens\_edit RETURNS STRING

SONAME 'version\_token.so';

CREATE FUNCTION version\_tokens\_delete RETURNS STRING

SONAME 'version\_token.so';

CREATE FUNCTION version\_tokens\_lock\_shared RETURNS INT

SONAME 'version\_token.so';

CREATE FUNCTION version\_tokens\_lock\_exclusive RETURNS INT

SONAME 'version\_token.so';

CREATE FUNCTION version\_tokens\_unlock RETURNS INT

SONAME 'version\_token.so';

你必须安装这些功能来管理服务器的版本令牌列表，但你也必须安装该插件，因为没有它，这些功能就不能正常工作。

如果在复制源服务器上使用该插件和功能，也要在所有复制服务器上安装它们，以避免复制问题。

一旦按照刚才描述的方式安装，该插件和功能就会一直安装，直到卸载。要删除它们，请使用UNINSTALL PLUGIN和DROP FUNCTION语句。

UNINSTALL PLUGIN version\_tokens;

DROP FUNCTION version\_tokens\_set;

DROP FUNCTION version\_tokens\_show;

DROP FUNCTION version\_tokens\_edit;

DROP FUNCTION version\_tokens\_delete;

DROP FUNCTION version\_tokens\_lock\_shared;

DROP FUNCTION version\_tokens\_lock\_exclusive;

DROP FUNCTION version\_tokens\_unlock;

#### 5.6.6.3 使用 Version Tokens

使用版本令牌之前，请根据第5.6.6.2节 "安装或卸载版本令牌 "提供的说明安装它。

版本令牌可以发挥作用的一个场景是一个系统，该系统访问MySQL服务器的集合，但需要通过监控它们并根据负载变化调整服务器的分配来管理它们以达到负载平衡的目的。这样一个系统包括这些要素。

- 要管理的MySQL服务器的集合。

- 一个与服务器通信并将它们组织成高可用性组的管理或管理应用程序。组有不同的目的，每个组内的服务器可能有不同的分配。某个组内的服务器的分配可以在任何时候改变。

- 访问服务器以检索和更新数据的客户应用程序，根据分配给它们的目的选择服务器。例如，一个客户端不应该向一个只读的服务器发送更新。

版本令牌允许根据分配来管理服务器的访问，而不需要客户重复查询服务器的分配。

- 管理应用程序执行服务器的分配，并在每个服务器上建立版本令牌以反映其分配。该应用程序缓存了这些信息，以提供一个中央访问点。

如果在某些时候，管理应用程序需要改变一个服务器的分配（例如，把它从允许写入改为只读），它就会改变服务器的版本令牌列表并更新其缓存。

- 为了提高性能，客户端应用程序从管理应用程序获得缓存信息，使他们能够避免为每个语句检索服务器分配的信息。根据它发出的语句的类型（例如，读与写），客户端选择一个合适的服务器并连接到它。

- 此外，客户端向服务器发送它自己的特定于客户端的版本令牌，以注册它要求服务器的分配。对于客户端发送给服务器的每个语句，服务器将自己的令牌列表与客户端的令牌列表进行比较。如果服务器令牌列表包含客户令牌列表中存在的所有具有相同价值的令牌，则存在匹配，服务器会执行该语句。

另一方面，也许管理应用程序已经改变了服务器分配和它的版本令牌列表。在这种情况下，新的服务器分配现在可能与客户端的要求不兼容。服务器和客户机令牌列表之间发生令牌不匹配，服务器在回复语句时返回一个错误。这是一个指示，让客户端从管理应用程序缓存中刷新其版本令牌信息，并选择一个新的服务器进行通信。

检测版本令牌错误和选择新服务器的客户端逻辑可以用不同的方式实现。

- 客户端可以自己处理所有的版本令牌注册、不匹配检测和连接切换。

- 这些动作的逻辑可以在管理客户端和MySQL服务器之间连接的连接器中实现。这样的连接器可以自己处理错配错误检测和语句重发，或者它可以将错误传递给应用程序，让应用程序重新发送语句。

下面的例子以更具体的形式说明了前面的讨论。

当版本令牌在一个给定的服务器上初始化时，服务器的版本令牌列表是空的。令牌列表的维护是通过调用函数进行的。VERSION\_TOKEN\_ADMIN权限（或被废弃的SUPER权限）是调用任何版本令牌函数所必需的，所以令牌列表的修改预计将由拥有该权限的管理或管理应用程序来完成。

假设一个管理应用程序与一组服务器进行通信，这些服务器被客户查询以访问雇员和产品数据库（分别命名为emp和prod）。所有的服务器都被允许处理数据检索语句，但是只有其中一些服务器被允许进行数据库更新。为了在数据库特定的基础上处理这个问题，管理应用程序在每个服务器上建立了一个版本令牌列表。在给定服务器的令牌列表中，令牌名称代表数据库名称，令牌值是读还是写，取决于数据库是否必须以只读方式使用或是否可以接受读和写。

客户端应用程序通过设置一个系统变量来注册他们要求服务器匹配的版本令牌列表。变量设置发生在特定的客户基础上，所以不同的客户可以注册不同的要求。默认情况下，客户端令牌列表是空的，它与任何服务器令牌列表相匹配。当客户端将其令牌列表设置为非空值时，匹配可能会成功或失败，这取决于服务器的版本令牌列表。

为了定义一个服务器的版本令牌列表，管理应用程序调用version\_tokens\_set()函数。(还有用于修改和显示令牌列表的函数，后面会介绍）。例如，应用程序可能向一组三个服务器发送这些语句。

Server 1:

mysql> **SELECT version\_tokens\_set('emp=read;prod=read');**

+------------------------------------------+

| version\_tokens\_set('emp=read;prod=read') |

+------------------------------------------+

| 2 version tokens set. |

+------------------------------------------+

Server 2:

mysql> **SELECT version\_tokens\_set('emp=write;prod=read');**

+-------------------------------------------+

| version\_tokens\_set('emp=write;prod=read') |

+-------------------------------------------+

| 2 version tokens set. |

+-------------------------------------------+

Server 3:

mysql> **SELECT version\_tokens\_set('emp=read;prod=write');**

+-------------------------------------------+

| version\_tokens\_set('emp=read;prod=write') |

+-------------------------------------------+

| 2 version tokens set. |

+-------------------------------------------+

The token list in each case is specified as a semicolon-separated list of ***name*=*value*** pairs. The resulting token list values result in these server assingments:

* Any server accepts reads for either database.
* Only server 2 accepts updates for the **emp** database.
* Only server 3 accepts updates for the **prod** database.

In addition to assigning each server a version token list, the management application also maintains a cache that reflects the server assignments.

Before communicating with the servers, a client application contacts the management application and retrieves information about server assignments. Then the client selects a server based on those assignments. Suppose that a client wants to perform both reads and writes on the **emp** database. Based on the preceding assignments, only server 2 qualifies. The client connects to server 2 and registers its server requirements there by setting its **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** system variable:

mysql> **SET @@SESSION.version\_tokens\_session = 'emp=write';**

For subsequent statements sent by the client to server 2, the server compares its own version token list to the client list to check whether they match. If so, statements execute normally:

mysql> **UPDATE emp.employee SET salary = salary \* 1.1 WHERE id = 4981;**

Query OK, 1 row affected (0.07 sec)

Rows matched: 1 Changed: 1 Warnings: 0

mysql> **SELECT last\_name, first\_name FROM emp.employee WHERE id = 4981;**

+-----------+------------+

| last\_name | first\_name |

+-----------+------------+

| Smith | Abe |

+-----------+------------+

1 row in set (0.01 sec)

Discrepancies between the server and client version token lists can occur two ways:

* A token name in the **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** value is not present in the server token list. In this case, an [**ER\_VTOKEN\_PLUGIN\_TOKEN\_NOT\_FOUND**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_vtoken_plugin_token_not_found) error occurs.
* A token value in the **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** value differs from the value of the corresponding token in the server token list. In this case, an [**ER\_VTOKEN\_PLUGIN\_TOKEN\_MISMATCH**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_vtoken_plugin_token_mismatch) error occurs.

As long as the assignment of server 2 does not change, the client continues to use it for reads and writes. But suppose that the management application wants to change server assignments so that writes for the **emp** database must be sent to server 1 instead of server 2. To do this, it uses **[version\_tokens\_edit()](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-edit)** to modify the **emp** token value on the two servers (and updates its cache of server assignments):

Server 1:

mysql> **SELECT version\_tokens\_edit('emp=write');**

+----------------------------------+

| version\_tokens\_edit('emp=write') |

+----------------------------------+

| 1 version tokens updated. |

+----------------------------------+

Server 2:

mysql> **SELECT version\_tokens\_edit('emp=read');**

+---------------------------------+

| version\_tokens\_edit('emp=read') |

+---------------------------------+

| 1 version tokens updated. |

+---------------------------------+

[**version\_tokens\_edit()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#function_version-tokens-edit) modifies the named tokens in the server token list and leaves other tokens unchanged.

The next time the client sends a statement to server 2, its own token list no longer matches the server token list and an error occurs:

mysql> **UPDATE emp.employee SET salary = salary \* 1.1 WHERE id = 4982;**

ERROR 3136 (42000): Version token mismatch for emp. Correct value read

In this case, the client should contact the management application to obtain updated information about server assignments, select a new server, and send the failed statement to the new server.

**Note**

Each client must cooperate with Version Tokens by sending only statements in accordance with the token list that it registers with a given server. For example, if a client registers a token list of **'emp=read'**, there is nothing in Version Tokens to prevent the client from sending updates for the **emp** database. The client itself must refrain from doing so.

For each statement received from a client, the server implicitly uses locking, as follows:

* Take a shared lock for each token named in the client token list (that is, in the [**version\_tokens\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_tokens_session) value)
* Perform the comparison between the server and client token lists
* Execute the statement or produce an error depending on the comparison result
* Release the locks

The server uses shared locks so that comparisons for multiple sessions can occur without blocking, while preventing changes to the tokens for any session that attempts to acquire an exclusive lock before it manipulates tokens of the same names in the server token list.

The preceding example uses only a few of the functions included in the Version Tokens plugin library, but there are others. One set of functions permits the server's list of version tokens to be manipulated and inspected. Another set of functions permits version tokens to be locked and unlocked.

These functions permit the server's list of version tokens to be created, changed, removed, and inspected:

* [**version\_tokens\_set()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#function_version-tokens-set) completely replaces the current list and assigns a new list. The argument is a semicolon-separated list of ***name*=*value*** pairs.
* [**version\_tokens\_edit()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#function_version-tokens-edit) enables partial modifications to the current list. It can add new tokens or change the values of existing tokens. The argument is a semicolon-separated list of ***name*=*value*** pairs.
* [**version\_tokens\_delete()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#function_version-tokens-delete) deletes tokens from the current list. The argument is a semicolon-separated list of token names.
* [**version\_tokens\_show()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#function_version-tokens-show) displays the current token list. It takes no argument.

Each of those functions, if successful, returns a binary string indicating what action occurred. The following example establishes the server token list, modifies it by adding a new token, deletes some tokens, and displays the resulting token list:

mysql> **SELECT version\_tokens\_set('tok1=a;tok2=b');**

+-------------------------------------+

| version\_tokens\_set('tok1=a;tok2=b') |

+-------------------------------------+

| 2 version tokens set. |

+-------------------------------------+

mysql> **SELECT version\_tokens\_edit('tok3=c');**

+-------------------------------+

| version\_tokens\_edit('tok3=c') |

+-------------------------------+

| 1 version tokens updated. |

+-------------------------------+

mysql> **SELECT version\_tokens\_delete('tok2;tok1');**

+------------------------------------+

| version\_tokens\_delete('tok2;tok1') |

+------------------------------------+

| 2 version tokens deleted. |

+------------------------------------+

mysql> **SELECT version\_tokens\_show();**

+-----------------------+

| version\_tokens\_show() |

+-----------------------+

| tok3=c; |

+-----------------------+

Warnings occur if a token list is malformed:

mysql> **SELECT version\_tokens\_set('tok1=a; =c');**

+----------------------------------+

| version\_tokens\_set('tok1=a; =c') |

+----------------------------------+

| 1 version tokens set. |

+----------------------------------+

1 row in set, 1 warning (0.00 sec)

mysql> **SHOW WARNINGS\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Level: Warning

Code: 42000

Message: Invalid version token pair encountered. The list provided

is only partially updated.

1 row in set (0.00 sec)

As mentioned previously, version tokens are defined using a semicolon-separated list of ***name*=*value*** pairs. Consider this invocation of **[version\_tokens\_set()](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-set)**:

mysql> **SELECT version\_tokens\_set('tok1=b;;; tok2= a = b ; tok1 = 1\'2 3"4')**

+---------------------------------------------------------------+

| version\_tokens\_set('tok1=b;;; tok2= a = b ; tok1 = 1\'2 3"4') |

+---------------------------------------------------------------+

| 3 version tokens set. |

+---------------------------------------------------------------+

版本代号对参数的解释如下。

- 名称和值周围的空白被忽略。名称和值中的空白是允许的。(对于version\_tokens\_delete()，它需要一个没有值的名字列表，名字周围的空白被忽略。)

- 没有引号机制。

- 令牌的顺序并不重要，但如果一个令牌列表包含一个给定的令牌名称的多个实例，最后的值优先于先前的值。

鉴于这些规则，前面的version\_tokens\_set()调用的结果是一个有两个标记的标记列表：tok1的值是1'2 3"4，tok2的值是a = b。

mysql> **SELECT version\_tokens\_show();**

+--------------------------+

| version\_tokens\_show() |

+--------------------------+

| tok2=a = b;tok1=1'2 3"4; |

+--------------------------+

如果令牌列表包含两个令牌，为什么version\_tokens\_set()返回的值是3 version tokens set？这是因为原来的令牌列表包含两个tok1的定义，而第二个定义取代了第一个定义。

版本令牌的令牌操作函数对令牌名称和值有这些限制。

- 代币名称不能包含=或;字符，最大长度为64个字符。

- 令牌值不能包含;字符。值的长度受max\_allowed\_packet系统变量值的限制。

- Version Tokens将令牌名称和值视为二进制字符串，因此比较时要注意大小写。

版本代币还包括一组函数，使代币可以被锁定和解锁。

- version\_tokens\_lock\_exclusive() 获取独占的版本标记锁。它接收一个或多个锁名的列表和一个超时值。

- version\_tokens\_lock\_shared() 获取共享的版本令牌锁。它需要一个或多个锁名的列表和一个超时值。

- version\_tokens\_unlock() 释放版本标记锁（独占和共享）。它不需要参数。

每个锁函数如果成功，则返回非零。否则，会发生错误。

mysql> **SELECT version\_tokens\_lock\_shared('lock1', 'lock2', 0);**

+-------------------------------------------------+

| version\_tokens\_lock\_shared('lock1', 'lock2', 0) |

+-------------------------------------------------+

| 1 |

+-------------------------------------------------+

mysql> **SELECT version\_tokens\_lock\_shared(NULL, 0);**

ERROR 3131 (42000): Incorrect locking service lock name '(null)'.

使用Version Tokens锁定功能的锁定是咨询性的；应用程序必须同意合作。

有可能锁定不存在的令牌名称。这并不创建令牌。

注意

版本令牌锁定功能是基于第5.6.9.1节 "锁定服务 "所描述的锁定服务，因此对共享和独占锁有相同的语义。(版本令牌使用内置在服务器中的锁服务例程，而不是锁服务函数接口，所以不需要安装这些函数来使用版本令牌）。由版本令牌获得的锁使用版本令牌的锁服务命名空间（version\_token\_locks）。锁定服务锁可以使用性能模式进行监控，所以这对版本令牌锁也是如此。详情请见锁定服务监控。

对于版本令牌锁定函数，令牌名称参数完全按照规定使用。周围的空白不被忽略，=和;字符是允许的。这是因为版本令牌只是将要锁定的令牌名称原封不动地传递给锁定服务

5.6.6.4 Version Tokens Reference

The following discussion serves as a reference to these Version Tokens elements:

* [Version Tokens Functions](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#version-tokens-routines)
* [Version Tokens System Variables](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#version-tokens-system-variables)

##### Version Tokens Functions

The Version Tokens plugin library includes several functions. One set of functions permits the server's list of version tokens to be manipulated and inspected. Another set of functions permits version tokens to be locked and unlocked. The [**VERSION\_TOKEN\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_version-token-admin) privilege (or the deprecated [**SUPER**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_super) privilege) is required to invoke any Version Tokens function.

The following functions permit the server's list of version tokens to be created, changed, removed, and inspected. Interpretation of ***name\_list*** and ***token\_list*** arguments (including whitespace handling) occurs as described in [Section 5.6.6.3, “Using Version Tokens”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#version-tokens-usage), which provides details about the syntax for specifying tokens, as well as additional examples.

* **[version\_tokens\_delete(](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-delete)*[name\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-delete)*[)](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-delete)**

Deletes tokens from the server's list of version tokens using the ***name\_list*** argument and returns a binary string that indicates the outcome of the operation. ***name\_list*** is a semicolon-separated list of version token names to delete.

mysql> **SELECT version\_tokens\_delete('tok1;tok3');**

+------------------------------------+

| version\_tokens\_delete('tok1;tok3') |

+------------------------------------+

| 2 version tokens deleted. |

+------------------------------------+

An argument of **NULL** is treated as an empty string, which has no effect on the token list.

[**version\_tokens\_delete()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#function_version-tokens-delete) deletes the tokens named in its argument, if they exist. (It is not an error to delete nonexisting tokens.) To clear the token list entirely without knowing which tokens are in the list, pass **NULL** or a string containing no tokens to **[version\_tokens\_set()](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-set)**:

mysql> **SELECT version\_tokens\_set(NULL);**

+------------------------------+

| version\_tokens\_set(NULL) |

+------------------------------+

| Version tokens list cleared. |

+------------------------------+

mysql> **SELECT version\_tokens\_set('');**

+------------------------------+

| version\_tokens\_set('') |

+------------------------------+

| Version tokens list cleared. |

+------------------------------+

* **[version\_tokens\_edit(](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-edit)*[token\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-edit)*[)](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-edit)**

Modifies the server's list of version tokens using the ***token\_list*** argument and returns a binary string that indicates the outcome of the operation. ***token\_list*** is a semicolon-separated list of ***name*=*value*** pairs specifying the name of each token to be defined and its value. If a token exists, its value is updated with the given value. If a token does not exist, it is created with the given value. If the argument is **NULL** or a string containing no tokens, the token list remains unchanged.

mysql> **SELECT version\_tokens\_set('tok1=value1;tok2=value2');**

+-----------------------------------------------+

| version\_tokens\_set('tok1=value1;tok2=value2') |

+-----------------------------------------------+

| 2 version tokens set. |

+-----------------------------------------------+

mysql> **SELECT version\_tokens\_edit('tok2=new\_value2;tok3=new\_value3');**

+--------------------------------------------------------+

| version\_tokens\_edit('tok2=new\_value2;tok3=new\_value3') |

+--------------------------------------------------------+

| 2 version tokens updated. |

+--------------------------------------------------------+

* **[version\_tokens\_set(](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-set)*[token\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-set)*[)](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-set)**

Replaces the server's list of version tokens with the tokens defined in the ***token\_list*** argument and returns a binary string that indicates the outcome of the operation. ***token\_list*** is a semicolon-separated list of ***name*=*value*** pairs specifying the name of each token to be defined and its value. If the argument is **NULL** or a string containing no tokens, the token list is cleared.

mysql> **SELECT version\_tokens\_set('tok1=value1;tok2=value2');**

+-----------------------------------------------+

| version\_tokens\_set('tok1=value1;tok2=value2') |

+-----------------------------------------------+

| 2 version tokens set. |

+-----------------------------------------------+

* **[version\_tokens\_show()](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-show)**

Returns the server's list of version tokens as a binary string containing a semicolon-separated list of ***name*=*value*** pairs.

mysql> **SELECT version\_tokens\_show();**

+--------------------------+

| version\_tokens\_show() |

+--------------------------+

| tok2=value2;tok1=value1; |

+--------------------------+

The following functions permit version tokens to be locked and unlocked:

* **[version\_tokens\_lock\_exclusive(](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-exclusive)*[token\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-exclusive)*[[,](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-exclusive)*[token\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-exclusive)*[] ...,](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-exclusive)*[timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-exclusive)*[)](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-exclusive)**

Acquires exclusive locks on one or more version tokens, specified by name as strings, timing out with an error if the locks are not acquired within the given timeout value.

mysql> **SELECT version\_tokens\_lock\_exclusive('lock1', 'lock2', 10);**

+-----------------------------------------------------+

| version\_tokens\_lock\_exclusive('lock1', 'lock2', 10) |

+-----------------------------------------------------+

| 1 |

+-----------------------------------------------------+

* **[version\_tokens\_lock\_shared(](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-shared)*[token\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-shared)*[[,](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-shared)*[token\_name](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-shared)*[] ...,](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-shared)*[timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-shared)*[)](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-lock-shared)**

Acquires shared locks on one or more version tokens, specified by name as strings, timing out with an error if the locks are not acquired within the given timeout value.

mysql> **SELECT version\_tokens\_lock\_shared('lock1', 'lock2', 10);**

+--------------------------------------------------+

| version\_tokens\_lock\_shared('lock1', 'lock2', 10) |

+--------------------------------------------------+

| 1 |

+--------------------------------------------------+

* **[version\_tokens\_unlock()](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_version-tokens-unlock)**

Releases all locks that were acquired within the current session using [**version\_tokens\_lock\_exclusive()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#function_version-tokens-lock-exclusive) and [**version\_tokens\_lock\_shared()**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#function_version-tokens-lock-shared).

mysql> **SELECT version\_tokens\_unlock();**

+-------------------------+

| version\_tokens\_unlock() |

+-------------------------+

| 1 |

+-------------------------+

The locking functions share these characteristics:

* The return value is nonzero for success. Otherwise, an error occurs.
* Token names are strings.
* In contrast to argument handling for the functions that manipulate the server token list, whitespace surrounding token name arguments is not ignored and **=** and **;** characters are permitted.
* It is possible to lock nonexisting token names. This does not create the tokens.
* Timeout values are nonnegative integers representing the time in seconds to wait to acquire locks before timing out with an error. If the timeout is 0, there is no waiting and the function produces an error if locks cannot be acquired immediately.
* Version Tokens locking functions are based on the locking service described at [Section 5.6.9.1, “The Locking Service”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#locking-service).

##### Version Tokens System Variables

Version Tokens supports the following system variables. These variables are unavailable unless the Version Tokens plugin is installed (see [Section 5.6.6.2, “Installing or Uninstalling Version Tokens”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#version-tokens-installation)).

System variables:

* **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--version-tokens-session=value** |
| **System Variable** | [**version\_tokens\_session**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_tokens_session) |
| **Scope** | Global, Session |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **NULL** |

* The session value of this variable specifies the client version token list and indicates the tokens that the client session requires the server version token list to have.
* If the **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** variable is **NULL** (the default) or has an empty value, any server version token list matches. (In effect, an empty value disables matching requirements.)
* If the **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** variable has a nonempty value, any mismatch between its value and the server version token list results in an error for any statement the session sends to the server. A mismatch occurs under these conditions:
  + A token name in the **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** value is not present in the server token list. In this case, an [**ER\_VTOKEN\_PLUGIN\_TOKEN\_NOT\_FOUND**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_vtoken_plugin_token_not_found) error occurs.
  + A token value in the **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** value differs from the value of the corresponding token in the server token list. In this case, an [**ER\_VTOKEN\_PLUGIN\_TOKEN\_MISMATCH**](https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html#error_er_vtoken_plugin_token_mismatch) error occurs.

It is not a mismatch for the server version token list to include a token not named in the **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** value.

Suppose that a management application has set the server token list as follows:

mysql> **SELECT version\_tokens\_set('tok1=a;tok2=b;tok3=c');**

+--------------------------------------------+

| version\_tokens\_set('tok1=a;tok2=b;tok3=c') |

+--------------------------------------------+

| 3 version tokens set. |

+--------------------------------------------+

A client registers the tokens it requires the server to match by setting its **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** value. Then, for each subsequent statement sent by the client, the server checks its token list against the client **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** value and produces an error if there is a mismatch:

mysql> **SET @@SESSION.version\_tokens\_session = 'tok1=a;tok2=b';**

mysql> **SELECT 1;**

+---+

| 1 |

+---+

| 1 |

+---+

mysql> **SET @@SESSION.version\_tokens\_session = 'tok1=b';**

mysql> **SELECT 1;**

ERROR 3136 (42000): Version token mismatch for tok1. Correct value a

The first [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) succeeds because the client tokens **tok1** and **tok2** are present in the server token list and each token has the same value in the server list. The second [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) fails because, although **tok1** is present in the server token list, it has a different value than specified by the client.

At this point, any statement sent by the client fails, unless the server token list changes such that it matches again. Suppose that the management application changes the server token list as follows:

mysql> **SELECT version\_tokens\_edit('tok1=b');**

+-------------------------------+

| version\_tokens\_edit('tok1=b') |

+-------------------------------+

| 1 version tokens updated. |

+-------------------------------+

mysql> **SELECT version\_tokens\_show();**

+-----------------------+

| version\_tokens\_show() |

+-----------------------+

| tok3=c;tok1=b;tok2=b; |

+-----------------------+

Now the client **[version\_tokens\_session](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session)** value matches the server token list and the client can once again successfully execute statements:

mysql> **SELECT 1;**

+---+

| 1 |

+---+

| 1 |

+---+

* **[version\_tokens\_session\_number](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_version_tokens_session_number)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--version-tokens-session-number=#** |
| **System Variable** | [**version\_tokens\_session\_number**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_version_tokens_session_number) |
| **Scope** | Global, Session |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |

* This variable is for internal use.

### 5.6.7 Clone 插件

5.6.7.1 安装克隆插件

5.6.7.2 本地克隆数据

5.6.7.3 克隆远程数据

5.6.7.4 克隆加密的数据

5.6.7.5 克隆压缩的数据

5.6.7.6 用于复制的克隆

5.6.7.7 在克隆操作中创建的目录和文件

5.6.7.8 远程克隆操作的失败处理

5.6.7.9 监控克隆操作

5.6.7.10 停止克隆操作

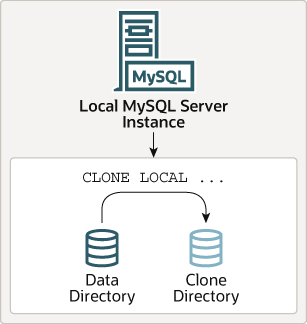
5.6.7.11 克隆系统变量参考

5.6.7.12 克隆系统变量

5.6.7.13 克隆插件的局限性

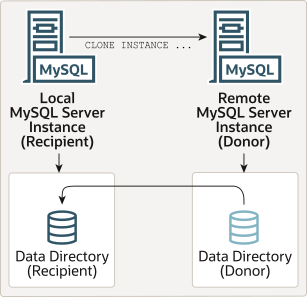
在MySQL 8.0.17中引入的克隆插件，允许在本地或从远程MySQL服务器实例克隆数据。克隆的数据是存储在InnoDB中的数据的物理快照，包括模式、表、表空间和数据字典元数据。克隆的数据包括一个功能齐全的数据目录，它允许使用克隆插件来配置MySQL服务器。

**Figure 5.1 Local Cloning Operation**



本地克隆操作将数据从启动克隆操作的MySQL服务器实例克隆到MySQL服务器实例运行的同一服务器或节点上的一个目录。

**Figure 5.2 Remote Cloning Operation**



远程克隆操作涉及一个启动克隆操作的本地MySQL服务器实例（"接收者"），以及一个源数据所在的远程MySQL服务器实例（"捐赠者"）。当远程克隆操作在接收者上启动时，克隆的数据将通过网络从捐赠者传输到接收者。默认情况下，远程克隆操作会删除接收方数据目录中的数据，并将其替换为克隆的数据。你可以选择将数据克隆到接收方的不同目录中，以避免删除现有数据。

本地克隆操作和远程克隆操作所克隆的数据没有区别。这两种操作都会克隆相同的数据。

克隆插件支持复制。除了克隆数据，克隆操作还可以从捐赠者那里提取和传输复制坐标，并将它们应用到接收者身上，这样就可以使用克隆插件来配置组复制的成员和副本。使用克隆插件进行配置比复制大量事务要快得多，也更有效率（见第5.6.7.6节，"复制的克隆"）。组复制成员也可以被配置为使用克隆插件作为恢复的替代方法，这样成员就会自动选择最有效的方式从种子成员中检索组数据。更多信息，请参阅第18.5.3.2节，"分布式恢复的克隆"。

克隆插件支持克隆加密的和页面压缩的数据。参见第5.6.7.4节 "克隆加密数据"，以及第5.6.7.5节 "克隆压缩数据"。

克隆插件必须在使用前安装。关于安装说明，见第5.6.7.1节 "安装克隆插件"。关于克隆说明，请参见第5.6.7.2节，"本地克隆数据"，以及第5.6.7.3节，"克隆远程数据"。

性能模式表和工具被提供用于监控克隆操作。参见章节5.6.7.9, "监控克隆操作"。

#### 5.6.7.1 Installing the Clone Plugin

本节描述了如何安装和配置克隆插件。对于远程克隆操作，克隆插件必须安装在捐赠者和接受者的MySQL服务器实例上。

关于安装或卸载插件的一般信息，见第5.6.1节 "安装和卸载插件"。

为了能被服务器使用，插件库文件必须位于MySQL插件目录中（由plugin\_dir系统变量命名的目录）。如果需要，在服务器启动时设置plugin\_dir的值，以告诉服务器插件目录的位置。

插件库文件的基本名称是mysql\_clone.so。文件名后缀因平台而异（例如，Unix和类似Unix的系统为.so，Windows为.dll）。

要在服务器启动时加载插件，使用 --plugin-load-add 选项来命名包含它的库文件。使用这种插件加载方法，必须在每次服务器启动时给出该选项。例如，在你的my.cnf文件中放入这些行，根据需要为你的平台调整.so后缀。

[mysqld］

plugin-load-add=mysql\_clone.so

在修改my.cnf后，重启服务器以使新设置生效。

注意

在从以前的MySQL版本升级时，重新启动服务器时，不能使用--plugin-load-add选项来加载克隆插件。例如，在将二进制文件或软件包从MySQL 5.7升级到MySQL 8.0之后，试图用plugin-load-add=mysql\_clone.so来重启服务器会导致这个错误。[ERROR] [MY-013238] [Server] 错误安装插件'clone'。在升级过程中无法安装。解决办法是在尝试用plugin-load-add=mysql\_clone.so启动服务器之前，先升级服务器。

另外，要在运行时加载该插件，请使用此语句，必要时为你的平台调整.so后缀。

INSTALL PLUGIN clone SONAME 'mysql\_clone.so'。

INSTALL PLUGIN 加载该插件，并在 mysql.plugins 系统表中注册该插件，以使该插件在随后的每次正常服务器启动时被加载，而不需要 --plugin-load-add。

为了验证插件的安装，检查INFORMATION\_SCHEMA.PLUGINS表或使用SHOW PLUGINS语句（见5.6.2节，"获取服务器插件信息"）。比如说。

mysql> **SELECT PLUGIN\_NAME, PLUGIN\_STATUS**

**FROM INFORMATION\_SCHEMA.PLUGINS**

**WHERE PLUGIN\_NAME = 'clone';**

+------------------------+---------------+

| PLUGIN\_NAME | PLUGIN\_STATUS |

+------------------------+---------------+

| clone | ACTIVE |

+------------------------+---------------+

如果插件初始化失败，请检查服务器错误日志中的克隆或插件相关的诊断信息。

如果该插件之前已经用INSTALL PLUGIN注册，或者用--plugin-load-add加载，你可以在服务器启动时使用--clone选项来控制插件的激活状态。例如，要在启动时加载插件并防止它在运行时被删除，可以使用这些选项。

[mysqld]

plugin-load-add=mysql\_clone.so

clone=FORCE\_PLUS\_PERMANENT

如果你想防止服务器在没有克隆插件的情况下运行，可以使用--clone，其值为FORCE或FORCE\_PLUS\_PERMANENT，在插件没有成功初始化的情况下，强制服务器启动失败。

关于插件激活状态的更多信息，请参阅控制插件激活状态。

#### 5.6.7.2 Cloning Data Locally

克隆插件支持以下语法，用于本地克隆数据；也就是说，从本地MySQL数据目录克隆数据到MySQL服务器实例运行的同一服务器或节点上的另一个目录。

CLONE LOCAL DATA DIRECTORY [=] 'clone\_dir'。

要使用CLONE语法，必须安装clone插件。关于安装说明，见第5.6.7.1节，"安装克隆插件"。

执行CLONE LOCAL DATA DIRECTORY语句需要BACKUP\_ADMIN权限。

mysql> GRANT BACKUP\_ADMIN ON \*.\* TO 'clone\_user';

其中clone\_user是执行克隆操作的MySQL用户。你选择执行克隆操作的用户可以是任何在\*.\*上具有BACKUP\_ADMIN权限的MySQL用户。

下面的例子演示了本地克隆数据。

mysql> CLONE LOCAL DATA DIRECTORY = '/path/to/clone\_dir';

其中/path/to/clone\_dir是数据被克隆到的本地目录的完整路径。需要一个绝对路径，而且指定的目录（"clone\_dir"）必须不存在，但指定的路径必须是一个存在的路径。MySQL服务器必须有必要的写入权限来创建该目录。

注意

本地克隆操作不支持克隆位于数据目录之外的用户创建的表或表空间。试图克隆此类表或表空间会导致以下错误。错误 1086 (hy000)。文件'/path/to/tablespace\_name.ibd'已经存在。克隆一个与源表空间路径相同的表空间将导致冲突，因此被禁止。

所有其他用户创建的InnoDB表和表空间、InnoDB系统表空间、重做日志和撤销表空间被克隆到指定的目录。

如果需要，你可以在克隆操作完成后在克隆的目录上启动MySQL服务器。

shell> mysqld\_safe --datadir=clone\_dir

其中clone\_dir是数据被克隆到的目录。

For information about monitoring cloning operation status and progress, see [Section 5.6.7.9, “Monitoring Cloning Operations”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#clone-plugin-monitoring).

#### 5.6.7.3 Cloning Remote Data

克隆插件支持以下克隆远程数据的语法；即从远程MySQL服务器实例（捐赠者）克隆数据，并将其传输到启动克隆操作的MySQL实例（接收者）。

CLONE INSTANCE FROM 'user'@'host':port

IDENTIFIED BY 'password

[数据目录[=]'clone\_dir']

[require [no] ssl];

其中。

- user是捐赠者MySQL服务器实例上的克隆用户。

- password是用户密码。

- host是捐赠者MySQL服务器实例的主机名地址。不支持互联网协议版本6（IPv6）地址格式。可以使用IPv6地址的别名来代替。IPv4地址可以照常使用。

- port是捐赠者MySQL服务器实例的端口号。(mysqlx\_port指定的X协议端口不被支持。通过MySQL Router连接到捐赠者的MySQL服务器实例也不被支持）。

- 数据目录[=]'clone\_dir'是一个可选的子句，用于为你正在克隆的数据指定接收者上的一个目录。如果你不想删除接收方数据目录中的现有数据，请使用这个选项。需要一个绝对路径，并且该目录必须不存在。MySQL服务器必须有必要的写入权限来创建该目录。

当不使用可选的DATA DIRECTORY [=]'clone\_dir'子句时，克隆操作会删除接收方数据目录中的现有数据，用克隆的数据替换它，并在之后自动重新启动服务器。

- [REQUIRE [NO] SSL] 明确指定在网络上传输克隆数据时是否要使用加密连接。如果不能满足明确的规范，将返回一个错误。如果没有指定SSL子句，克隆会默认尝试建立一个加密连接，如果安全连接尝试失败，会退回到不安全的连接。在克隆加密数据时，无论是否指定该子句，都需要一个安全连接。更多信息，请参阅为克隆配置加密连接。

注意

默认情况下，驻留在捐赠方MySQL服务器实例的数据目录中的用户创建的InnoDB表和表空间被克隆到接收方MySQL服务器实例的数据目录中。如果指定了DATA DIRECTORY [=] 'clone\_dir'子句，它们将被克隆到指定的目录。

用户创建的InnoDB表和表空间如果位于捐赠者MySQL服务器实例的数据目录之外，将被克隆到接收者MySQL服务器实例的相同路径。如果一个表或表空间已经存在，则报告错误。

默认情况下，InnoDB系统表空间、重做日志和撤销表空间被克隆到捐赠者上配置的相同位置（分别由innodb\_data\_home\_dir和innodb\_data\_file\_path、innodb\_log\_group\_home\_dir以及innodb\_undo\_directory定义）。如果指定了DATA DIRECTORY [=] 'clone\_dir'子句，这些表空间和日志就会被克隆到指定的目录中。

远程克隆的前提条件

要执行克隆操作，克隆插件必须在捐赠者和接收者的MySQL服务器实例上都处于活动状态。关于安装说明，见第5.6.7.1节，"安装克隆插件"。

在捐赠者和接受者上需要一个MySQL用户来执行克隆操作（"克隆用户"）。

- 在捐赠者上，克隆用户需要BACKUP\_ADMIN权限来访问和传输捐赠者的数据，并在克隆操作期间阻止DDL。

- 在接收方，克隆用户需要CLONE\_ADMIN权限来替换接收方的数据，在克隆操作中阻止DDL，并自动重新启动服务器。CLONE\_ADMIN权限包括隐含的BACKUP\_ADMIN和SHUTDOWN权限。

创建克隆用户和授予所需权限的说明包括在本先决条件信息后面的远程克隆示例中。

在执行CLONE INSTANCE语句时，会检查以下先决条件。

- 捐赠者和接受者必须有相同的MySQL服务器版本。克隆插件在MYSQL 8.0.17及以上版本中得到支持。

* mysql> SHOW VARIABLES LIKE 'version';
* +---------------+--------+
* | Variable\_name | Value |
* +---------------+--------+
* | version | 8.0.17 |
* +---------------+--------+

- 捐赠者和接受者的MySQL服务器实例必须运行在相同的操作系统和平台上。例如，如果捐赠者实例在Linux 64位平台上运行，接收者实例也必须在该平台上运行。有关如何确定你的操作系统平台的信息，请参考你的操作系统文档。

- 接受者必须有足够的磁盘空间来存放克隆的数据。默认情况下，接收者数据在克隆捐赠者数据之前被删除，所以你只需要为捐赠者数据提供足够的空间。如果你使用DATA DIRECTORY子句克隆到一个命名的目录，你必须有足够的磁盘空间容纳现有的接收者数据和克隆的数据。你可以通过检查文件系统上的数据目录大小和数据目录外的任何表空间的大小来估计数据的大小。当估计供体上的数据大小时，记住只有InnoDB数据被克隆。如果你在其他存储引擎中存储数据，请相应地调整你的数据大小估算。

- InnoDB允许在数据目录之外创建一些表空间类型。如果捐赠者的MySQL服务器实例有驻扎在数据目录之外的表空间，克隆操作必须能够访问这些表空间。你可以查询INFORMATION\_SCHEMA.FILES表来识别位于数据目录之外的表空间。位于数据目录之外的文件有一个完全合格的路径，指向数据目录之外的目录。

mysql> SELECT FILE\_NAME FROM INFORMATION\_SCHEMA.FILES。

- 在捐赠者上激活的插件，包括任何钥匙圈插件，也必须在接收者上激活。你可以通过发出 SHOW PLUGINS 语句或查询 INFORMATION\_SCHEMA.PLUGINS 表来识别活跃的插件。

- 捐赠者和接受者必须有相同的MySQL服务器字符集和排序。关于MySQL服务器字符集和排序的信息，请参见第10.15节，"字符集配置"。

- 捐赠者和接受者需要有相同的innodb\_page\_size和innodb\_data\_file\_path设置。在捐赠者和接收者上的innodb\_data\_file\_path设置必须指定相同数量的同等大小的数据文件。你可以使用SHOW VARIABLES语法检查变量设置。

* mysql> SHOW VARIABLES LIKE 'innodb\_page\_size';
* mysql> SHOW VARIABLES LIKE 'innodb\_data\_file\_path';

- 如果克隆加密的或页面压缩的数据，捐赠者和接受者必须有相同的文件系统块大小。对于页面压缩的数据，接收者的文件系统必须支持稀疏文件和打洞，以便在接收者上进行打洞。关于这些功能的信息以及如何识别使用这些功能的表和表空间，请参见第5.6.7.4节 "克隆加密数据 "和第5.6.7.5节 "克隆压缩数据"。要确定你的文件系统块大小，请参考你的操作系统文档。

- 如果你要克隆加密的数据，需要一个安全的连接。参见为克隆配置一个加密连接。

- 收件人上的clone\_valid\_donor\_list设置必须包括捐赠者MySQL服务器实例的主机地址。你只能从有效捐赠者名单上的主机克隆数据。需要一个具有SYSTEM\_VARIABLES\_ADMIN权限的MySQL用户来配置这个变量。设置clone\_valid\_donor\_list变量的说明在本节后面的远程克隆例子中提供。你可以使用SHOW VARIABLES语法检查clone\_valid\_donor\_list的设置。

- mysql> SHOW VARIABLES LIKE 'clone\_valid\_donor\_list' 。

- 必须没有其他克隆操作在运行。每次只允许有一个克隆操作。要确定一个克隆操作是否正在运行，可以查询clone\_status表。参见使用Performance Schema Clone表监控克隆操作。

- 克隆插件以1MB的数据包加上元数据来传输数据。因此，在捐赠者和接收者的MySQL服务器实例上，所需的最小max\_allowed\_packet值是2MB。如果max\_allowed\_packet值小于2MB，就会导致错误。使用下面的查询来检查你的max\_allowed\_packet设置。

- mysql> SHOW VARIABLES LIKE 'max\_allowed\_packet';

以下先决条件也适用。

- 捐赠者上的撤销表空间文件名必须是唯一的。当数据被克隆到接收方时，撤销表空间，无论其在捐赠方的位置如何，都会被克隆到接收方的innodb\_undo\_directory位置或由DATA DIRECTORY [=] 'clone\_dir'子句指定的目录，如果使用的话。由于这个原因，不允许在捐赠者上有重复的撤销表空间文件名。从MySQL 8.0.18开始，如果在克隆操作中遇到重复的撤销表空间文件名，将报告一个错误。在MySQL 8.0.18之前，克隆具有相同文件名的撤销表空间可能导致撤销表空间文件在接收方被覆盖。

要查看捐赠者上的撤销表空间文件名以确保它们是唯一的，可查询INFORMATION\_SCHEMA.FILES。

mysql> SELECT TABLESPACE\_NAME, FILE\_NAME FROM INFORMATION\_SCHEMA.FILES

WHERE FILE\_TYPE LIKE 'UNDO LOG';

关于删除和添加撤销表空间文件的信息，见第15.6.3.4节，"撤销表空间"。

- 默认情况下，接收方的MySQL服务器实例在数据被克隆后会自动重新启动（停止和启动）。为了使自动重启发生，接收方必须有一个监控程序来检测服务器的关闭。否则，在数据克隆后，克隆操作会因以下错误而停止，并且接收方的MySQL服务器实例被关闭。

错误3707（hy000）。重新启动服务器失败（mysqld不是由监督者进程管理的）。

这个错误并不表明克隆失败。它意味着在数据克隆后，必须再次手动启动接收方的MySQL服务器实例。在手动启动服务器后，你可以连接到接收方的MySQL服务器实例，并检查性能模式克隆表，以验证克隆操作是否成功完成（参见使用性能模式克隆表监控克隆操作。）RESTART语句具有相同的监控过程要求。更多信息请参见章节13.7.8.8, "RESTART语句"。如果使用DATA DIRECTORY子句克隆到一个命名的目录，这个要求就不适用，因为在这种情况下不会执行自动重启。

- 有几个变量控制远程克隆操作的各个方面。在执行远程克隆操作之前，请查看这些变量，并根据需要调整设置以适应你的计算环境。克隆变量是在执行克隆操作的接收方MySQL服务器实例上设置的。见第5.6.7.12节，"克隆系统变量"。

##### Cloning Remote Data

* 1. 下面的例子演示了克隆远程数据。默认情况下，远程克隆操作会删除接收者数据目录中的数据，用克隆的数据取代它，并在之后重新启动MySQL服务器。
  2. 该例子假设远程克隆的先决条件得到满足。参见远程克隆先决条件。
  3. 1. 1. 用一个管理用户账户登录到捐赠者的MySQL服务器实例。
  4. Create a clone user with the [**BACKUP\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_backup-admin) privilege.
  5. mysql> CREATE USER 'donor\_clone\_user'@'example.donor.host.com' IDENTIFIED BY '***password***';
  6. mysql> GRANT BACKUP\_ADMIN on \*.\* to 'donor\_clone\_user'@'example.donor.host.com';
  7. Install the clone plugin:
  8. mysql> INSTALL PLUGIN clone SONAME 'mysql\_clone.so';

1. Login to the recipient MySQL server instance with an administrative user account.
   1. Create a clone user with the [**CLONE\_ADMIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\security.html#priv_clone-admin) privilege.
   2. mysql> CREATE USER 'recipient\_clone\_user'@'example.recipient.host.com' IDENTIFIED BY '***password***';
   3. mysql> GRANT CLONE\_ADMIN on \*.\* to 'recipient\_clone\_user'@'example.recipient.host.com';
   4. Install the clone plugin:
   5. mysql> INSTALL PLUGIN clone SONAME 'mysql\_clone.so';
   6. Add the host address of the donor MySQL server instance to the **[clone\_valid\_donor\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_valid_donor_list)** variable setting.

mysql> SET GLOBAL clone\_valid\_donor\_list = '***example.donor.host.com***:***3306***';

1. Log on to the recipient MySQL server instance as the clone user you created previously (**recipient\_clone\_user'@'example.recipient.host.com**) and execute the [**CLONE INSTANCE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#clone) statement.
2. mysql> CLONE INSTANCE FROM 'donor\_clone\_user'@'example.donor.host.com':3306
3. IDENTIFIED BY '***password***';

After the data is cloned, the MySQL server instance on the recipient is restarted automatically.

For information about monitoring cloning operation status and progress, see [Section 5.6.7.9, “Monitoring Cloning Operations”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#clone-plugin-monitoring).

##### Cloning to a Named Directory

默认情况下，远程克隆操作会删除接收方数据目录中的数据，并以克隆的数据取代。通过克隆到一个命名的目录，你可以避免删除接收者数据目录中的现有数据。

克隆到命名目录的过程与克隆远程数据中描述的过程相同，但有一个例外。CLONE INSTANCE语句必须包括DATA DIRECTORY子句。比如说。

mysql> CLONE INSTANCE FROM '***user***'@'***example.donor.host.com***':***3306***

IDENTIFIED BY '***password***'

DATA DIRECTORY = '***/path/to/clone\_dir***';

需要一个绝对路径，而且该目录必须不存在。MySQL服务器必须有必要的写入权限来创建该目录。

当克隆到一个命名的目录时，接收的MySQL服务器实例在数据被克隆后不会自动重新启动。如果你想在命名的目录上重启MySQL服务器，你必须手动这样做。

shell> mysqld\_safe --datadir=/path/to/clone\_dir

其中/path/to/clone\_dir是指向接收方上的命名目录的路径。

为克隆配置一个加密的连接

你可以为远程克隆操作配置一个加密的连接，以保护数据在网络上的克隆。在克隆加密数据时，默认需要加密连接。(见第5.6.7.4节，"克隆加密数据"）。

下面的说明描述了如何配置接收方的MySQL服务器实例以使用加密连接。假设捐赠者的MySQL服务器实例已经被配置为使用加密连接。如果没有，请参阅第6.3.1节 "配置MySQL使用加密连接"，了解服务器端的配置说明。

要配置接收方的MySQL服务器实例使用加密连接。

1. 使捐赠者MySQL服务器实例的客户证书和密钥文件对接收者主机可用。要么使用安全通道将文件分发给接收方主机，要么将它们放在接收方主机可以访问的挂载分区中。要提供的客户证书和密钥文件包括。

- ca.pem

自签的证书授权（CA）文件。

- client-cert.pem

客户端公钥证书文件。

- client-key.pem

客户端私钥文件。

2. 在接收方的MySQL服务器实例上配置以下SSL选项。

- clone\_ssl\_ca

指定自签名的证书授权（CA）文件的路径。

- clone\_ssl\_cert

指定客户公钥证书文件的路径。

- 克隆\_ssl\_key

指明路径 to the client private key file.

1. For example:
2. clone\_ssl\_ca=/***path***/***to***/ca.pem
3. clone\_ssl\_cert=/***path***/***to***/client-cert.pem
4. clone\_ssl\_key=/***path***/***to***/client-key.pem
5. To require that an encrypted connection is used, include the **REQUIRE SSL** clause when issuing the [**CLONE**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#clone) statement on the recipient.
6. mysql> CLONE INSTANCE FROM '***user***'@'***example.donor.host.com***':***3306***
7. IDENTIFIED BY '***password***'
8. DATA DIRECTORY = '***/path/to/clone\_dir***'
9. REQUIRE SSL;

如果没有指定SSL子句，克隆插件默认会尝试建立一个加密连接，如果加密连接尝试失败，则会退回到未加密的连接。

注意

如果你正在克隆加密数据，无论是否指定REQUIRE SSL子句，默认情况下都需要一个加密的连接。如果你试图克隆加密数据，使用REQUIRE NO SSL会导致一个错误。

#### 5.6.7.4 Cloning Encrypted Data

支持加密数据的克隆。以下要求适用。

- 克隆远程数据时需要安全连接，以确保未加密的表空间密钥在网络上的安全传输。表空间密钥在传输前在捐赠者处被解密，并在接收者处使用接收者的主密钥重新进行加密。如果加密连接不可用，或者在CLONE INSTANCE语句中使用了REQUIRE NO SSL子句，则报告错误。关于为克隆配置加密连接的信息，请参阅为克隆配置加密连接。

- 当将数据克隆到使用本地管理的钥匙圈的本地数据目录时，在克隆目录上启动MySQL服务器时必须使用相同的钥匙圈。

- 当克隆数据到使用本地管理的钥匙圈的远程数据目录（接收者目录）时，在克隆目录上启动MySQL服务器时，必须使用接收者的钥匙圈。

注意

当克隆操作正在进行时，innodb\_redo\_log\_encrypt和innodb\_undo\_log\_encrypt变量设置不能被修改。

关于数据加密功能的信息，参见章节15.13, "InnoDB静态数据加密"。

5.6.7.5 克隆压缩数据

支持克隆页面压缩的数据。以下要求适用于克隆远程数据。

- 接收者的文件系统必须支持稀疏文件和打洞，以便在接收者上进行打洞。

- 捐赠者和接收者的文件系统必须有相同的块大小。如果文件系统的块大小不同，就会报告类似以下的错误。错误 3868 (HY000)。克隆配置FS块大小。捐赠者的值：114688 与接受者的值不同。4096.

关于页面压缩功能的信息，请参见第15.9.2节，"InnoDB页面压缩"。

5.6.7.6 复制的克隆

克隆插件支持复制。除了克隆数据之外，克隆操作还可以从捐赠者那里提取复制坐标，并将它们传输给接收者，这使得克隆插件可以用来配置组复制的成员和副本。使用克隆插件来配置，比复制大量的事务要快得多，也更有效率。

组复制成员也可以被配置为使用克隆插件作为分布式恢复的一个选项，在这种情况下，加入的成员会自动选择最有效的方式从现有的组成员中检索组数据。更多信息，请参阅第18.5.3.2节，"分布式恢复的克隆"。

在克隆操作期间，二进制日志位置（文件名、偏移量）和gtid\_executed GTID集都被提取并从捐赠者的MySQL服务器实例传输到接受者。这些数据允许在复制流中的一致位置启动复制。在文件中保存的二进制日志和中继日志不会从捐赠者复制到接收者。为了启动复制，接收者追赶捐赠者所需的二进制日志在数据克隆和复制开始的时间之间不能被清除。如果所需的二进制日志不可用，会报告复制握手错误。因此，克隆的实例应该被添加到复制组中，不要过度延迟，以避免所需的二进制日志被清除或新成员明显滞后，需要更多的恢复时间。

- 在一个克隆的MySQL服务器实例上发出这个查询，以检查被转移到接收者的二进制日志位置。

* mysql> SELECT BINLOG\_FILE, BINLOG\_POSITION FROM performance\_schema.clone\_status;
* Issue this query on a cloned MySQL server instance to check the **[gtid\_executed](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\replication.html" \l "sysvar_gtid_executed)** GTID set that was transferred to the recipient:
* mysql> SELECT @@GLOBAL.GTID\_EXECUTED;

在MySQL 8.0中，默认情况下，复制元数据存储库被保存在克隆操作期间从捐赠者复制到接受者的表中。复制元数据存储库持有与复制相关的配置设置，可用于在克隆操作后正确恢复复制。

- 在MySQL 8.0.17和8.0.18中，只有表mysql.slave\_master\_info（连接元数据存储库）被复制了。

- 从MySQL 8.0.19开始，表mysql.slave\_relay\_log\_info（applier元数据存储库）和mysql.slave\_worker\_info（applier worker元数据存储库）也被复制了。

关于每个表所包含的内容的列表，请参阅第17.2.4.2节 "复制元数据存储库"。注意，如果在服务器上使用设置master\_info\_repository=FILE和relay\_log\_info\_repository=FILE（这不是MySQL 8.0中的默认设置，已被废弃），复制元数据存储库不会被克隆；只有当TABLE被设置时，它们才被克隆。

要为复制进行克隆，请执行以下步骤。

1. 对于组复制的新组成员，首先为组复制配置MySQL服务器实例，按照第18.2.1.6节 "向组添加实例 "中的说明进行。还要设置第18.5.3.2节 "为分布式恢复进行克隆 "中描述的克隆的先决条件。当你在加入的成员上发布 START GROUP\_REPLICATION 时，克隆操作由组复制自动管理，所以你不需要手动进行操作，也不需要在加入的成员上执行任何进一步的设置步骤。

2. 对于源/副本MySQL复制拓扑结构中的副本，首先手动将数据从捐赠者的MySQL服务器实例克隆到接受者。捐赠者必须是复制拓扑中的一个源或副本。关于克隆说明，见第5.6.7.3节，"克隆远程数据"。

3. 3. 在克隆操作成功完成后，如果你想在接收者的MySQL服务器实例上使用与捐赠者上存在的相同的复制通道，验证其中哪些可以在源/副本的MySQL复制拓扑中自动恢复复制，哪些需要手动设置。

- 对于基于GTID的复制，如果接收者被配置为gtid\_mode=ON，并且从具有gtid\_mode=ON、ON\_PERMISSIVE或OFF\_PERMISSIVE的捐赠者克隆，来自捐赠者的gtid\_executed GTID集将应用于接收者。如果接收方是从已经在拓扑结构中的复制中克隆出来的，在接收方上使用GTID自动定位的复制通道可以在克隆操作后在通道启动时自动恢复复制。如果你只是想使用这些相同的通道，你不需要进行任何手动设置。

- 对于基于二进制日志文件位置的复制，如果接收者处于MySQL 8.0.17或8.0.18，来自捐赠者的二进制日志位置不会在接收者上应用，只是记录在性能模式clone\_status表中。因此，接收方上使用基于二进制日志文件位置的复制通道必须手动设置，以便在克隆操作后恢复复制。确保这些通道没有被配置为在服务器启动时自动开始复制，因为它们还没有二进制日志位置，并试图从头开始复制。

- 对于基于二进制日志文件位置的复制，如果接收者是在MySQL 8.0.19或以上，来自捐赠者的二进制日志位置将应用在接收者上。在收件人上使用基于二进制日志文件位置的复制通道，在重新启动复制之前，会自动尝试使用克隆的中继日志信息，进行中继日志恢复过程。对于单线程复制（slave\_parallel\_workers设置为0），在没有任何其他问题的情况下，中继日志恢复应该是成功的，使通道在没有进一步设置的情况下恢复复制。对于多线程复制（slave\_parallel\_workers大于0），中继日志恢复可能会失败，因为它通常不能自动完成。在这种情况下，会发出一个错误信息，你必须手动设置通道。

4. 如果你需要手动设置克隆的复制通道，或者想在接收者上使用不同的复制通道，下面的说明提供了将接收者的MySQL服务器实例添加到复制拓扑结构中的摘要和简略的例子。也请参考适用于你的复制设置的详细说明。

- 要将接收方MySQL服务器实例添加到使用基于GTID的交易作为复制数据源的MySQL复制拓扑中，请按照第17.1.3.4节 "使用GTID设置复制 "中的说明，按要求配置该实例。为实例添加复制通道，如以下简略的例子所示。CHANGE REPLICATION SOURCE TO语句（从MySQL 8.0.23开始）或CHANGE MASTER TO语句（在MySQL 8.0.23之前）必须定义源的主机地址和端口号，并且SOURCE\_AUTO\_POSITION | MASTER\_AUTO\_POSITION选项应被启用，如图所示。

* + mysql> CHANGE MASTER TO MASTER\_HOST = '***source\_host\_name***', MASTER\_PORT = ***source\_port\_num***,
  + ...
  + MASTER\_AUTO\_POSITION = 1,
  + FOR CHANNEL '***setup\_channel***';
  + mysql> START SLAVE USER = '***user\_name***' PASSWORD = '***password***' FOR CHANNEL '***setup\_channel***';
  + Or from MySQL 8.0.22 and 8.0.23:
  + mysql> CHANGE SOURCE TO SOURCE\_HOST = '***source\_host\_name***', SOURCE\_PORT = ***source\_port\_num***,
  + ...
  + SOURCE\_AUTO\_POSITION = 1,
  + FOR CHANNEL '***setup\_channel***';
  + mysql> START REPLICA USER = '***user\_name***' PASSWORD = '***password***' FOR CHANNEL '***setup\_channel***';

- 要将接收方的MySQL服务器实例添加到使用基于二进制日志文件位置的复制的MySQL复制拓扑中，按照第17.1.2节 "设置基于二进制日志文件位置的复制 "中的说明，按要求配置该实例。如以下简略的例子所示，为实例添加复制通道，使用在克隆操作中传输给接收者的二进制日志位置。

* + mysql> SELECT BINLOG\_FILE, BINLOG\_POSITION FROM performance\_schema.clone\_status;
  + mysql> CHANGE MASTER TO MASTER\_HOST = '***source\_host\_name***', MASTER\_PORT = ***source\_port\_num***,
  + ...
  + MASTER\_LOG\_FILE = '***source\_log\_name***',
  + MASTER\_LOG\_POS = ***source\_log\_pos***,
  + FOR CHANNEL '***setup\_channel***';
  + mysql> START SLAVE USER = '***user\_name***' PASSWORD = '***password***' FOR CHANNEL '***setup\_channel***';
  + Or from MySQL 8.0.22 and 8.0.23:
  + mysql> SELECT BINLOG\_FILE, BINLOG\_POSITION FROM performance\_schema.clone\_status;
  + mysql> CHANGE SOURCE TO SOURCE\_HOST = '***source\_host\_name***', SOURCE\_PORT = ***source\_port\_num***,
  + ...
  + SOURCE\_LOG\_FILE = '***source\_log\_name***',
  + SOURCE\_LOG\_POS = ***source\_log\_pos***,
  + FOR CHANNEL '***setup\_channel***';
  + mysql> START REPLICA USER = '***user\_name***' PASSWORD = '***password***' FOR CHANNEL '***setup\_channel***';

#### 5.6.7.7 Directories and Files Created During a Cloning Operation

当数据被克隆时，以下目录和文件被创建供内部使用。它们不应该被修改。

- #clone: 包含克隆操作所使用的内部克隆文件。在数据被克隆到的目录中创建。

- #ib\_archive。包含内部归档的日志文件，在克隆操作期间在捐赠者身上归档。

- \*.#clone文件。当现有的数据目录被远程克隆操作替换时，在接收者上创建的临时数据文件。

5.6.7.8 远程克隆操作的失败处理

本节描述了在克隆操作的不同阶段的故障处理。

1. 先决条件被检查（见远程克隆先决条件）。

- 如果在前提条件检查中发生故障，CLONE INSTANCE操作会报告一个错误。

2. 2.备份锁被采取，以阻止DDL操作。

- 如果克隆操作无法在clone\_ddl\_timeout变量指定的时限内获得DDL锁，就会报告错误。

3. 在数据被克隆到接收方数据目录之前，接收方上的用户创建的数据（模式、表、表空间）和二进制日志被删除。

- 在远程克隆操作中，当用户创建的数据从接收方移除时，接收方数据目录中的现有数据不会被保存，如果发生故障，可能会丢失。如果接收者上要替换的数据很重要，在启动远程克隆操作之前应该进行备份。

为了提供信息，警告会被打印到服务器错误日志中，以指定数据删除开始和结束的时间。

[Warning] [MY-013453] [InnoDB] Clone removing all user data for provisioning:

Started...

[Warning] [MY-013453] [InnoDB] Clone removing all user data for provisioning:

Finished

如果在删除数据时发生故障，接收者可能会留下在克隆操作前存在的部分模式、表和表空间。在克隆操作的执行过程中或失败后的任何时候，服务器总是处于一个一致的状态。

1. 数据从捐赠者那里克隆过来。用户创建的数据、字典元数据和其他系统数据被克隆。

- 如果在克隆数据时发生故障，克隆操作将被回滚，所有克隆的数据被删除。在这个阶段，接收者上先前存在的数据也被删除，这使得接收者没有用户数据。

如果发生这种情况，你可以纠正失败的原因，重新执行克隆操作，或者放弃克隆操作，从克隆操作前的备份中恢复接收方的数据。

2. 服务器自动重新启动（适用于不克隆到指定目录的远程克隆操作）。在启动过程中，典型的服务器启动任务被执行。

- 如果自动服务器重启失败，你可以手动重启服务器以完成克隆操作。

在MySQL 8.0.24之前，如果在克隆操作期间发生网络错误，如果错误在5分钟内得到解决，操作就会恢复。从MySQL 8.0.24开始，如果错误在捐赠者实例上定义的clone\_donor\_timeout\_after\_network\_failure变量所指定的时间内解决，则操作会恢复。clone\_donor\_timeout\_after\_network\_failure默认设置为5分钟，但支持0到30分钟的范围。如果操作没有在分配的时间内恢复，它将中止并返回一个错误，并且捐赠者将放弃快照。设置为零会使捐赠者在发生网络错误时立即放弃快照。配置较长的超时允许有更多的时间来解决网络问题，但也增加了捐赠者实例上的delta大小，这增加了克隆的恢复时间，以及在克隆打算作为复制或复制组成员的情况下的复制滞后。

在MySQL 8.0.24之前，供体线程在监听克隆协议命令时使用MySQL服务器wait\_timeout设置。因此，低的wait\_timeout设置可能导致长期运行的远程克隆操作超时。从MySQL 8.0.24开始，克隆空闲超时被设置为默认的wait\_timeout设置，即28800秒（8小时）。

#### 5.6.7.9 Monitoring Cloning Operations

本节描述了监控克隆操作的选项。

- 使用性能模式克隆表监控克隆操作

- 使用Performance Schema阶段事件监控克隆操作

- 使用Performance Schema Clone Instrumentation来监控克隆操作

- Com\_clone状态变量

使用性能模式克隆表监控克隆操作

一个克隆操作可能需要一些时间来完成，这取决于数据量和其他与数据传输相关的因素。你可以使用clone\_status和clone\_progress性能模式表来监控接收方MySQL服务器实例上的克隆操作的状态和进度。

注意

clone\_status和clone\_progress性能模式表只能用于监视接收方MySQL服务器实例上的克隆操作。要监控捐赠者MySQL服务器实例上的克隆操作，请使用克隆阶段事件，如使用性能模式阶段事件监控克隆操作中所述。

- clone\_status表提供了当前或最后执行的克隆操作的状态。一个克隆操作有四个可能的状态。未开始，正在进行，已完成，和失败。

- clone\_progress表提供了当前或最后执行的克隆操作的进度信息，按阶段划分。克隆操作的阶段包括DROP DATA, FILE COPY, PAGE\_COPY, REDO\_COPY, FILE\_SYNC, RESTART, 和 RECOVERY。

要访问Performance Schema的克隆表，需要在Performance Schema上有SELECT和EXECUTE权限。

要检查一个克隆操作的状态。

1. 连接到接收方的MySQL服务器实例。

1. Query the **[clone\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-clone-status-table" \o "27.12.19.1 The clone_status Table)** table:
2. mysql> **SELECT STATE FROM performance\_schema.clone\_status;**
3. +-----------+
4. | STATE |
5. +-----------+
6. | Completed |
7. +-----------+

Should a failure occur during a cloning operation, you can query the **[clone\_status](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-clone-status-table" \o "27.12.19.1 The clone_status Table)** table for error information:

mysql> **SELECT STATE, ERROR\_NO, ERROR\_MESSAGE FROM performance\_schema.clone\_status;**

+-----------+----------+---------------+

| STATE | ERROR\_NO | ERROR\_MESSAGE |

+-----------+----------+---------------+

| Failed | xxx | "xxxxxxxxxxx" |

+-----------+----------+---------------+

要审查克隆操作的每个阶段的细节。

1. 连接到接收方的MySQL服务器实例。

2. 2. 查询clone\_progress表。例如，下面的查询提供了克隆操作的每个阶段的状态和结束时间数据。

1. mysql> **SELECT STAGE, STATE, END\_TIME FROM performance\_schema.clone\_progress;**
2. +-----------+-----------+----------------------------+
3. | stage | state | end\_time |
4. +-----------+-----------+----------------------------+
5. | DROP DATA | Completed | 2019-01-27 22:45:43.141261 |
6. | FILE COPY | Completed | 2019-01-27 22:45:44.457572 |
7. | PAGE COPY | Completed | 2019-01-27 22:45:44.577330 |
8. | REDO COPY | Completed | 2019-01-27 22:45:44.679570 |
9. | FILE SYNC | Completed | 2019-01-27 22:45:44.918547 |
10. | RESTART | Completed | 2019-01-27 22:45:48.583565 |
11. | RECOVERY | Completed | 2019-01-27 22:45:49.626595 |
12. +-----------+-----------+----------------------------+

For other clone status and progress data points that you can monitor, refer to [Section 27.12.19, “Performance Schema Clone Tables”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\performance-schema.html#performance-schema-clone-tables).

##### Monitoring Cloning Operations Using Performance Schema Stage Events

一个克隆操作可能需要一些时间来完成，这取决于数据量和其他与数据传输有关的因素。有三个阶段的事件用于监控克隆操作的进展。每个阶段事件报告WORK\_COMPLETED和WORK\_ESTIMATED值。随着操作的进展，报告的值会被修改。

这种监控克隆操作的方法可以在捐赠者或接收者的MySQL服务器实例上使用。

按照发生的顺序，克隆操作阶段事件包括。

- stage/innodb/clone（文件复制）。表示克隆操作的文件复制阶段的进展。WORK\_ESTIMATED 和 WORK\_COMPLETED 单位是文件块。要传输的文件数量在文件复制阶段开始时是已知的，而块的数量是根据文件的数量来估计的。WORK\_ESTIMATED 被设置为估计的文件块的数量。WORK\_COMPLETED在每个块被发送之后被更新。

- stage/innodb/clone（页面复制）。表示克隆操作的页面复制阶段的进度。WORK\_ESTIMATED和WORK\_COMPLETED单位是页。一旦文件复制阶段完成，将被转移的页数是已知的，并且WORK\_ESTIMATED被设置为这个值。WORK\_COMPLETED在每个页面被发送之后被更新。

- stage/innodb/clone（redo copy）。表示克隆操作的重做拷贝阶段的进度。WORK\_ESTIMATED和WORK\_COMPLETED单位是重做块。一旦页面复制阶段完成，将被转移的重做块的数量是已知的，并且WORK\_ESTIMATED被设置为这个值。WORK\_COMPLETED在每个块被发送后被更新。

下面的例子演示了如何启用stage/innodb/clone%事件工具和相关的消费者表来监控一个克隆操作。关于Performance Schema阶段事件工具和相关消费者的信息，请参见第27.12.5节 "Performance Schema阶段事件表"。

1. Enable the **stage/innodb/clone%** instruments:
2. mysql> **UPDATE performance\_schema.setup\_instruments SET ENABLED = 'YES'**
3. **WHERE NAME LIKE 'stage/innodb/clone%';**
4. Enable the stage event consumer tables, which include **[events\_stages\_current](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-events-stages-current-table" \o "27.12.5.1 The events_stages_current Table)**, **[events\_stages\_history](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-events-stages-history-table" \o "27.12.5.2 The events_stages_history Table)**, and **[events\_stages\_history\_long](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\performance-schema.html" \l "performance-schema-events-stages-history-long-table" \o "27.12.5.3 The events_stages_history_long Table)**.
5. mysql> **UPDATE performance\_schema.setup\_consumers SET ENABLED = 'YES'**
6. **WHERE NAME LIKE '%stages%';**
7. Run a cloning operation. In this example, a local data directory is cloned to a directory named **cloned\_dir**.
8. mysql> **CLONE LOCAL DATA DIRECTORY = '/path/to/cloned\_dir';**
9. Check the progress of the cloning operation by querying the 性能模式 events\_stages\_current表。显示的阶段性事件根据正在进行的克隆阶段而有所不同。WORK\_COMPLETED 列显示已完成的工作。WORK\_ESTIMATED 列显示了总共需要的工作。
10. mysql> **SELECT EVENT\_NAME, WORK\_COMPLETED, WORK\_ESTIMATED FROM performance\_schema.events\_stages\_current**
11. **WHERE EVENT\_NAME LIKE 'stage/innodb/clone%';**
12. +--------------------------------+----------------+----------------+
13. | EVENT\_NAME | WORK\_COMPLETED | WORK\_ESTIMATED |
14. +--------------------------------+----------------+----------------+
15. | stage/innodb/clone (redo copy) | 1 | 1 |
16. +--------------------------------+----------------+----------------+

如果克隆操作已经完成，events\_stages\_current 表返回一个空集。在这种情况下，你可以检查 events\_stages\_history 表来查看已完成操作的事件数据。例如。

mysql> **SELECT EVENT\_NAME, WORK\_COMPLETED, WORK\_ESTIMATED FROM events\_stages\_history**

**WHERE EVENT\_NAME LIKE 'stage/innodb/clone%';**

+--------------------------------+----------------+----------------+

| EVENT\_NAME | WORK\_COMPLETED | WORK\_ESTIMATED |

+--------------------------------+----------------+----------------+

| stage/innodb/clone (file copy) | 301 | 301 |

| stage/innodb/clone (page copy) | 0 | 0 |

| stage/innodb/clone (redo copy) | 1 | 1 |

+--------------------------------+----------------+----------------+

##### Monitoring Cloning Operations Using Performance Schema Clone Instrumentation

性能模式为克隆操作的高级性能监控提供工具。要查看可用的克隆工具，请发出以下查询。

mysql> **SELECT \* FROM performance\_schema.setup\_instruments**

**WHERE NAME LIKE WHERE NAME LIKE '%clone%';**

+----------------------------------------------+---------+

| NAME | ENABLED |

+----------------------------------------------+---------+

| wait/synch/mutex/innodb/clone\_snapshot\_mutex | NO |

| wait/synch/mutex/innodb/clone\_sys\_mutex | NO |

| wait/synch/mutex/innodb/clone\_task\_mutex | NO |

| wait/io/file/innodb/innodb\_clone\_file | YES |

| stage/innodb/clone (file copy) | YES |

| stage/innodb/clone (redo copy) | YES |

| stage/innodb/clone (page copy) | YES |

| statement/abstract/clone | YES |

| statement/clone/local | YES |

| statement/clone/client | YES |

| statement/clone/server | YES |

| memory/innodb/clone | YES |

| memory/clone/data | YES |

+----------------------------------------------+---------+

###### Wait Instruments

性能模式的等待工具跟踪需要时间的事件。克隆等待事件的工具包括。

- wait/synch/mutex/innodb/clone\_snapshot\_mutex。追踪克隆快照mutex的等待事件，它在多个克隆线程之间同步访问动态快照对象（在捐赠者和接受者）。

- wait/synch/mutex/innodb/clone\_sys\_mutex。追踪clone sys mutex的等待事件。在一个MySQL服务器实例中，有一个克隆系统对象。这个mutex同步了对捐赠者和接受者的克隆系统对象的访问。它被克隆线程和其他前台和后台线程获取。

- wait/synch/mutex/innodb/clone\_task\_mutex。追踪克隆任务mutex的等待事件，用于克隆任务管理。clone\_task\_mutex是由克隆线程获取的。

- wait/io/file/innodb/innodb\_clone\_file。追踪clone操作的文件的所有I/O等待操作。

关于监控InnoDB互斥等待的信息，请参见15.16.2节 "使用性能模式监控InnoDB互斥等待"。关于监控一般的等待事件的信息，参见章节27.12.4, "Performance Schema等待事件表"。

###### Stage Instruments

性能模式阶段事件跟踪声明执行过程中发生的步骤。克隆阶段事件文书包括。

- stage/innodb/clone（文件拷贝）。表示克隆操作的文件复制阶段的进展。

- stage/innodb/clone (redo copy)。表示克隆操作的重做拷贝阶段的进度。

- stage/innodb/clone (page copy): 表示克隆操作的页面拷贝阶段的进度。

关于使用阶段事件监控克隆操作的信息，请参见使用性能模式阶段事件监控克隆操作。关于监控阶段事件的一般信息，参见第27.12.5节 "性能模式阶段事件表"。

语句工具

性能模式的语句事件跟踪语句的执行。当一个克隆操作被启动时，克隆语句工具所跟踪的不同语句类型可能会被并行执行。你可以在Performance Schema语句事件表中观察这些语句事件。执行的语句数量取决于clone\_max\_concurrency和clone\_autotune\_concurrency设置。

克隆语句事件文书包括。

- statement/abstract/clone。在任何克隆操作被归类为本地、客户端或服务器操作类型之前，跟踪其语句事件。

- statement/clone/local。追踪本地克隆操作的克隆语句事件；在执行CLONE LOCAL语句时产生。

- statement/clone/client。追踪发生在接收方MySQL服务器实例上的远程克隆语句事件；当在接收方执行CLONE INSTANCE语句时生成。

- 语句/克隆/服务器。追踪发生在捐赠者MySQL服务器实例上的远程克隆语句事件；在接收者上执行CLONE INSTANCE语句时产生。

关于监控性能模式语句事件的信息，请参见第27.12.6节 "性能模式语句事件表"。

内存工具

性能模式的内存工具可以跟踪内存的使用情况。克隆内存使用情况的工具包括。

- 内存/innodb/clone。追踪InnoDB为动态快照分配的内存。

- memory/clone/data。追踪克隆插件在克隆操作中分配的内存。

关于使用Performance Schema监控内存使用情况的信息，请参见第27.12.20.10节，"内存汇总表"。

Com\_clone状态变量

Com\_clone状态变量提供了CLONE语句执行的计数。

更多信息，请参考章节5.1.10 "服务器状态变量 "中关于Com\_xxx语句计数器变量的讨论。

#### 5.6.7.10 Stopping a Cloning Operation

如果有必要，你可以用KILL QUERY processlist\_id语句停止一个克隆操作。

在接收方的MySQL服务器实例上，你可以从clone\_status表的PID列检索克隆操作的processlist标识符（PID）

mysql> SELECT \* FROM performance\_schema.clone\_status\G

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

ID: 1

PID: 8

STATE: In Progress

BEGIN\_TIME: 2019-07-15 11:58:36.767

END\_TIME: NULL

SOURCE: LOCAL INSTANCE

DESTINATION: /***path/to/clone\_dir***/

ERROR\_NO: 0

ERROR\_MESSAGE:

BINLOG\_FILE:

BINLOG\_POSITION: 0

GTID\_EXECUTED:

你也可以从INFORMATION\_SCHEMA PROCESSLIST表的ID列、SHOW PROCESSLIST输出的Id列或Performance Schema threads表的PROCESSLIST\_ID列检索进程列表标识符。这些获取PID信息的方法可以在捐赠者或接受者的MySQL服务器实例上使用。

#### 5.6.7.11 Clone System Variable Reference

**Table 5.6 Clone System Variable Reference**

| **Name** | **Cmd-Line** | **Option File** | **System Var** | **Status Var** | **Var Scope** | **Dynamic** |
| --- | --- | --- | --- | --- | --- | --- |
| [**clone\_autotune\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_autotune_concurrency) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_buffer_size) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_ddl\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ddl_timeout) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_donor\_timeout\_after\_network\_failure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_donor_timeout_after_network_failure) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_enable\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_enable_compression) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_max\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_concurrency) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_max\_data\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_data_bandwidth) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_max\_network\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_network_bandwidth) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_ca) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_cert) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_key) | Yes | Yes | Yes |  | Global | Yes |
| [**clone\_valid\_donor\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_valid_donor_list) | Yes | Yes | Yes |  | Global | Yes |

#### 5.6.7.12 Clone System Variables

本节描述了控制克隆插件操作的系统变量。如果在启动时指定的值不正确，克隆插件可能无法正常初始化，服务器不会加载它。在这种情况下，服务器也可能对其他克隆设置产生错误信息，因为它不能识别它们。

每个系统变量都有一个默认值。系统变量可以在服务器启动时使用命令行或选项文件中的选项来设置。它们可以在运行时使用SET语句动态改变，这使你能够修改服务器的操作，而不需要停止和重启它。

设置全局系统变量的运行时值通常需要SYSTEM\_VARIABLES\_ADMIN权限（或被废弃的SUPER权限）。更多信息请参见第5.1.9.1节 "系统变量权限"。

克隆变量是在执行克隆操作的接收方MySQL服务器实例上配置的。**[clone\_autotune\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_autotune_concurrency)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-autotune-concurrency** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**clone\_autotune\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_autotune_concurrency) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* When **[clone\_autotune\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_autotune_concurrency)** is enabled (the default), additional threads for remote cloning operations are spawned dynamically to optimize data transfer speed. The setting is applicable to recipient MySQL server instance only.
* During a cloning operation, the number of threads increases incrementally toward a target of double the current thread count. The effect on the data transfer speed is evaluated at each increment. The process either continues or stops according to the following rules:
  + If the data transfer speed degrades more than 5% with an incremental increase, the process stops.
  + If there is at least a 5% improvement after reaching 25% of the target, the process continues. Otherwise, the process stops.
  + If there is at least a 10% improvement after reaching 50% of the target, the process continues. Otherwise, the process stops.
  + If there is at least a 25% improvement after reaching the target, the process continues toward a new target of double the current thread count. Otherwise, the process stops.

The autotuning process does not support decreasing the number of threads.

The **[clone\_max\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_concurrency)** variable defines the maximum number of threads that can be spawned.

If **[clone\_autotune\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_autotune_concurrency)** is disabled, **[clone\_max\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_concurrency)** defines the number of threads spawned for a remote cloning operation.

* **[clone\_buffer\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_buffer_size)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-buffer-size** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**clone\_buffer\_size**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_buffer_size) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **4194304** |
| **Minimum Value** | **1048576** |
| **Maximum Value** | **268435456** |
| **Unit** | **bytes** |

* Defines the size of the intermediate buffer used when transferring data during a local cloning operation. The default value is 4 mebibytes (MiB). A larger buffer size may permit I/O device drivers to fetch data in parallel, which can improve cloning performance.

* **[clone\_ddl\_timeout](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_ddl_timeout)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-ddl-timeout** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**clone\_ddl\_timeout**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ddl_timeout) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **300** |
| **Minimum Value** | **0** |
| **Maximum Value** | **2592000** |
| **Unit** | **seconds** |

* The time in seconds to wait for a backup lock when executing a cloning operation. This setting is applied on both the donor and recipient MySQL server instances. A cloning operation cannot run concurrently with DDL operations. A backup lock is required on the donor and recipient MySQL server instances. The cloning operation waits for current DDL operations to finish. Once backup locks are acquired, DDL operations must wait for the cloning operation to finish. A value of 0 means that no backup lock is to be taken for the cloning operation. In this case, the cloning operation fails with an error if a DDL operation is attempted concurrently.

* **[clone\_donor\_timeout\_after\_network\_failure](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_donor_timeout_after_network_failure)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-donor-timeout-after-network-failure** |
| **Introduced** | 8.0.24 |
| **System Variable** | [**clone\_donor\_timeout\_after\_network\_failure**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_donor_timeout_after_network_failure) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **5** |
| **Minimum Value** | **0** |
| **Maximum Value** | **30** |
| **Unit** | **minutes** |

* Defines the amount of time in minutes the donor allows for the recipient to reconnect and restart a cloning operation after a network failure. For more information, see [Section 5.6.7.8, “Remote Cloning Operation Failure Handling”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#clone-plugin-failure-handling).
* This variable is set on the donor MySQL server instance. Setting it on the recipient MySQL server instance has no effect.

* **[clone\_enable\_compression](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_enable_compression)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-enable-compression** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**clone\_enable\_compression**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_enable_compression) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Enables compression of data at the network layer during a remote cloning operation. Compression saves network bandwidth at the cost of CPU. Enabling compression may improve the data transfer rate. This setting is only applied on the recipient MySQL server instance.

* **[clone\_max\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_concurrency)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-max-concurrency** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**clone\_max\_concurrency**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_concurrency) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **16** |
| **Minimum Value** | **1** |
| **Maximum Value** | **128** |

* Defines the maximum number of concurrent threads for a remote cloning operation. The default value is 16. A greater number of threads can improve cloning performance but also reduces the number of permitted simultaneous client connections, which can affect the performance of existing client connections. This setting is only applied on the recipient MySQL server instance.
* If **[clone\_autotune\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_autotune_concurrency)** is enabled (the default), **[clone\_max\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_concurrency)** is the maximum number of threads that can be dynamically spawned for a remote cloning operation. If **[clone\_autotune\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_autotune_concurrency)** is disabled, **[clone\_max\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_concurrency)** defines the number of threads spawned for a remote cloning operation.
* A minimum data transfer rate of 1 mebibyte (MiB) per thread is recommended for remote cloning operations. The data transfer rate for a remote cloning operation is controlled by the **[clone\_max\_data\_bandwidth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_data_bandwidth)** variable.

* **[clone\_max\_data\_bandwidth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_data_bandwidth)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-max-data-bandwidth** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**clone\_max\_data\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_data_bandwidth) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **1048576** |
| **Unit** | **miB/second** |

* Defines the maximum data transfer rate in mebibytes (MiB) per second for a remote cloning operation. This variable helps manage the performance impact of a cloning operation. A limit should be set only when donor disk I/O bandwidth is saturated, affecting performance. A value of 0 means “unlimited”, which permits cloning operations to run at the highest possible data transfer rate. This setting is only applicable to the recipient MySQL server instance.
* The minimum data transfer rate is 1 MiB per second, per thread. For example, if there are 8 threads, the minimum transfer rate is 8 MiB per second. The **[clone\_max\_concurrency](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_concurrency)** variable controls the maximum number threads spawned for a remote cloning operation.
* The requested data transfer rate specified by **[clone\_max\_data\_bandwidth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_data_bandwidth)** may differ from the actual data transfer rate reported by the **DATA\_SPEED** column in the **performance\_schema.clone\_progress** table. If your cloning operation is not achieving the desired data transfer rate and you have available bandwidth, check I/O usage on the recipient and donor. If there is underutilized bandwidth, I/O is the next mostly likely bottleneck.

* **[clone\_max\_network\_bandwidth](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_max_network_bandwidth)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-max-network-bandwidth** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**clone\_max\_network\_bandwidth**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_max_network_bandwidth) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Integer |
| **Default Value** | **0** |
| **Minimum Value** | **0** |
| **Maximum Value** | **1048576** |
| **Unit** | **miB/second** |

* Specifies the maximum approximate network transfer rate in mebibytes (MiB) per second for a remote cloning operation. This variable can be used to manage the performance impact of a cloning operation on network bandwidth. It should be set only when network bandwidth is saturated, affecting performance on the donor instance. A value of 0 means “unlimited”, which permits cloning at the highest possible data transfer rate over the network, providing the best performance. This setting is only applicable to the recipient MySQL server instance.

* **[clone\_ssl\_ca](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_ssl_ca)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-ssl-ca=file\_name** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**clone\_ssl\_ca**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_ca) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **empty string** |

* Specifies the path to the certificate authority (CA) file. Used to configure an encrypted connection for a remote cloning operation. This setting configured on the recipient and used when connecting to the donor.

* **[clone\_ssl\_cert](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_ssl_cert)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-ssl-cert=file\_name** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**clone\_ssl\_cert**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_cert) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **empty string** |

* Specifies the path to the public key certificate. Used to configure an encrypted connection for a remote cloning operation. This setting configured on the recipient and used when connecting to the donor.

* **[clone\_ssl\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_ssl_key)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-ssl-key=file\_name** |
| **Introduced** | 8.0.14 |
| **System Variable** | [**clone\_ssl\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_ssl_key) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **empty string** |

* Specifies the path to the private key file. Used to configure an encrypted connection for a remote cloning operation. This setting configured on the recipient and used when connecting to the donor.

* **[clone\_valid\_donor\_list](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_clone_valid_donor_list)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--clone-valid-donor-list=value** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**clone\_valid\_donor\_list**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_clone_valid_donor_list) |
| **Scope** | Global |
| **Dynamic** | Yes |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | String |
| **Default Value** | **NULL** |

- 为远程克隆操作定义有效的捐赠者主机地址。该设置应用于接收方的MySQL服务器实例。允许使用逗号分隔的数值列表，格式如下。"host1:port1,host2:port2,host3:port3"。不允许有空格。

- clone\_valid\_donor\_list变量通过提供对克隆数据来源的控制增加了一层安全性。配置clone\_valid\_donor\_list所需的权限与执行远程克隆操作所需的权限不同，这允许将这些职责分配给不同的角色。配置clone\_valid\_donor\_list需要SYSTEM\_VARIABLES\_ADMIN权限，而执行远程克隆操作需要CLONE\_ADMIN权限。

- 不支持互联网协议版本6（IPv6）的地址格式。不支持互联网协议版本6（IPv6）的地址格式。可以使用IPv6地址的别名来代替。可以使用一个IPv4地址。

#### 5.6.7.13 Clone Plugin Limitations

克隆插件要遵守这些限制。

- 在克隆操作中不允许使用DDL，包括TRUNCATE TABLE。在选择数据源时，应该考虑这个限制。一个变通的办法是使用专用的捐赠者实例，它可以在数据被克隆的时候容纳被阻止的DDL操作。允许并发的DML。

- 一个实例不能从不同的MySQL服务器版本或发行版中克隆。捐赠者和接受者必须有完全相同的MySQL服务器版本和发行版。例如，你不能在MySQL 5.7和MySQL 8.0之间克隆，或在MySQL 8.0.19和MySQL 8.0.20之间克隆。克隆插件仅在MySQL 8.0.17及以上版本中得到支持。

- 一次只能克隆一个MySQL实例。不支持在一次克隆操作中克隆多个MySQL实例。

- mysqlx\_port指定的X协议端口不支持远程克隆操作（当在CLONE INSTANCE语句中指定供体MySQL服务器实例的端口号时）。

- 克隆插件不支持MySQL服务器配置的克隆。接受者的MySQL服务器实例保留其配置，包括持久的系统变量设置（见第5.1.9.3节，"持久的系统变量"）。

- 克隆插件不支持二进制日志的克隆。

- 克隆插件只克隆存储在InnoDB中的数据。其他存储引擎的数据不会被克隆。存储在任何模式（包括sys模式）中的MyISAM和CSV表被克隆为空表。

- 不支持通过MySQL Router连接到捐赠者的MySQL服务器实例。

- 本地克隆操作不支持克隆用绝对路径创建的一般表空间。克隆的表空间文件与源表空间文件具有相同的路径，会导致冲突。

#### 5.6.8  Keyring Proxy Bridge 插件

MySQL Keyring最初使用服务器插件实现钥匙库功能，但在MySQL 8.0.24中开始过渡到使用组件基础设施。这一过渡包括修改使用组件基础设施的钥匙圈插件的底层实现。这是用名为daemon\_keyring\_proxy\_plugin的插件促成的，该插件作为插件和组件服务API之间的桥梁，使钥匙圈插件能够继续使用而不改变用户可见的特性。

daemon\_keyring\_proxy\_plugin是内置的，不需要做任何安装或启用。5.6.9 MySQL 插件服务

5.6.9.1 开锁服务

5.6.9.2 钥匙圈服务

MySQL服务器插件可以访问服务器 "插件服务"。插件服务接口通过暴露插件可以调用的服务器功能来补充插件的API。关于编写插件服务的开发者信息，请参见MySQL插件服务。下面几节描述了在SQL和C语言水平上可用的插件服务。

#### 5.6.9.1 Locking 服务

MySQL发行版提供了一个锁定接口，可以在两个层面上访问。

- 在SQL层面，作为一组可加载函数，每个函数都映射到对服务例程的调用。

- 作为一个C语言接口，可作为一个插件服务从服务器插件或可加载函数中调用。

关于插件服务的一般信息，见5.6.9节 "MySQL插件服务"。关于可加载函数的一般信息，见添加可加载函数。

锁定接口有这些特点。

- 锁有三个属性。锁命名空间、锁名称和锁模式。

o 锁是由命名空间和锁名的组合来识别的。命名空间使不同的应用程序能够使用相同的锁名，而不会因为在不同的命名空间创建锁而发生冲突。例如，如果应用程序A和B分别使用ns1和ns2的命名空间，每个应用程序可以使用锁名lock1和lock2，而不会干扰其他应用程序。

o 一个锁的模式是读或写。读锁是共享的。如果一个会话在一个给定的锁标识符上有一个读锁，其他会话可以获得相同标识符上的读锁。写锁是排他的：如果一个会话在一个给定的锁标识符上有一个写锁，其他会话不能在同一标识符上获得一个读或写锁。

- 名称空间和锁的名称必须是非NULL，非空，并且最大长度为64个字符。指定为NULL、空字符串或长度超过64个字符的命名空间或锁名称会导致ER\_LOCKING\_SERVICE\_WRONG\_NAME错误。

- 锁定接口将命名空间和锁的名称视为二进制字符串，因此比较是区分大小写的。

- 锁定接口提供了获取锁和释放锁的函数。调用这些函数不需要特殊的权限。权限检查是调用应用程序的责任。

- 如果不是立即可用，可以等待锁的到来。获取锁的调用需要一个整数的超时值，表明在放弃之前要等待多少秒来获取锁。如果达到超时而没有成功获取锁，就会发生ER\_LOCKING\_SERVICE\_TIMEOUT错误。如果超时为0，则没有等待，如果不能立即获得锁，则调用产生错误。

- 锁定接口检测不同会话中的锁获取调用之间的死锁。在这种情况下，锁服务会选择一个调用者并以ER\_LOCKING\_SERVICE\_DEADLOCK错误终止其锁获取请求。这个错误不会导致事务回滚。为了在死锁的情况下选择一个会话，锁定服务更倾向于持有读锁的会话，而不是持有写锁的会话。

- 一个会话可以通过一个锁获取调用来获取多个锁。对于一个给定的调用，锁的获取是原子性的。如果所有的锁都被获取，那么该调用就成功了。如果任何锁的获取失败，则调用没有获取任何锁，并且失败，通常会出现ER\_LOCKING\_SERVICE\_TIMEOUT或ER\_LOCKING\_SERVICE\_DEADLOCK错误。

- 一个会话可以为同一个锁标识符（命名空间和锁名组合）获取多个锁。这些锁的实例可以是读锁，写锁，或两者的混合。

- 会话中获得的锁通过调用release-locks函数显式释放，或者在会话终止时隐式释放（无论是正常还是异常）。当事务提交或回滚时，锁不会被释放。

- 在一个会话中，一个给定命名空间的所有锁在释放时都是一起释放的。

锁定服务提供的接口与GET\_LOCK()和相关SQL函数提供的接口不同（见第12.15节 "锁定函数"）。例如，GET\_LOCK()没有实现命名空间，并且只提供独占锁，而不是不同的读写锁。

##### 5.6.9.1.1  Locking Service C 接口

本节描述了如何使用锁定服务的C语言接口。要使用函数接口，请参阅第5.6.9.1.2节，"锁定服务的函数接口"。 关于锁定服务接口的一般特征，请参阅第5.6.9.1节，"锁定服务"。关于插件服务的一般信息，见第5.6.9节，"MySQL插件服务"。

使用锁定服务的源文件应该包括这个头文件。

#include <mysql/service\_locking.h>

To acquire one or more locks, call this function:

int mysql\_acquire\_locking\_service\_locks(MYSQL\_THD opaque\_thd,

const char\* lock\_namespace,

const char\*\*lock\_names,

size\_t lock\_num,

enum enum\_locking\_service\_lock\_type lock\_type,

unsigned long lock\_timeout);

这些参数有这些含义。

- opaque\_thd。一个线程句柄。如果指定为NULL，将使用当前线程的句柄。

- lock\_namespace。一个空尾的字符串，表示锁的命名空间。

- lock\_names: 一个空尾的字符串数组，提供要获取的锁的名称。

- lock\_num。lock\_names数组中名称的数量。

- lock\_type。锁模式，LOCKING\_SERVICE\_READ或LOCKING\_SERVICE\_WRITE，分别用于获取读锁或写锁。

- lock\_timeout。在放弃之前，等待获取锁的整数秒数。

要释放为给定命名空间获取的锁，请调用此函数。

int mysql\_release\_locking\_service\_locks(MYSQL\_THD opaque\_thd,

const char\* lock\_namespace);

这些参数有这些含义。

- opaque\_thd。一个线程句柄。如果指定为NULL，将使用当前线程的句柄。

- lock\_namespace。一个空尾的字符串，表示锁的命名空间。

锁定服务获取或等待的锁可以使用性能模式在SQL级别进行监控。详情请见锁服务监控。

##### 5.6.9.1.2 Locking Service函数接口

本节描述了如何使用由其可加载函数提供的锁定服务接口。要使用C语言接口，请参阅第5.6.9.1.1节，"锁定服务的C接口" 关于锁定服务接口的一般特征，请参阅第5.6.9.1节，"锁定服务"。关于可加载函数的一般信息，参见添加可加载函数。

- 安装或卸载锁定服务功能接口

- 使用锁定服务功能接口

- 锁定服务监控

- 锁定服务界面功能参考

安装或卸载锁定服务功能接口

在第5.6.9.1.1节 "锁定服务C接口 "中描述的锁定服务例程不需要安装，因为它们被内置在服务器中。但对于映射到调用服务例程的可加载函数来说，情况并非如此。这些函数在使用前必须被安装。本节描述了如何做到这一点。关于可加载函数安装的一般信息，请参阅第5.7.1节，"安装和卸载可加载函数"。

锁定服务功能是在一个插件库文件中实现的，该文件位于由plugin\_dir系统变量命名的目录中。文件的基本名称是locking\_service。每个平台的文件名后缀不同（例如，Unix和类Unix系统为.so，Windows为.dll）。

要安装锁定服务功能，使用CREATE FUNCTION语句，根据需要为你的平台调整.so后缀。

CREATE FUNCTION service\_get\_read\_locks RETURNS INT

SONAME 'locking\_service.so';

CREATE FUNCTION service\_get\_write\_locks RETURNS INT

SONAME 'locking\_service.so';

CREATE FUNCTION service\_release\_locks RETURNS INT

SONAME 'locking\_service.so';

If the functions are used on a replication source server, install them on all replica servers as well to avoid replication problems.

Once installed, the functions remain installed until uninstalled. To remove them, use the [**DROP FUNCTION**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#drop-function) statement:

DROP FUNCTION service\_get\_read\_locks;

DROP FUNCTION service\_get\_write\_locks;

DROP FUNCTION service\_release\_locks;

Using the Locking Service Function Interface

在使用锁定服务功能之前，请根据安装或卸载锁定服务功能接口提供的说明安装它们。

要获得一个或多个读锁，请调用这个函数。

mysql> **SELECT service\_get\_read\_locks('mynamespace', 'rlock1', 'rlock2', 10);**

+---------------------------------------------------------------+

| service\_get\_read\_locks('mynamespace', 'rlock1', 'rlock2', 10) |

+---------------------------------------------------------------+

| 1 |

+---------------------------------------------------------------+

The first argument is the lock namespace. The final argument is an integer timeout indicating how many seconds to wait to acquire the locks before giving up. The arguments in between are the lock names.

For the example just shown, the function acquires locks with lock identifiers **(mynamespace, rlock1)** and **(mynamespace, rlock2)**.

To acquire write locks rather than read locks, call this function:

mysql> **SELECT service\_get\_write\_locks('mynamespace', 'wlock1', 'wlock2', 10);**

+----------------------------------------------------------------+

| service\_get\_write\_locks('mynamespace', 'wlock1', 'wlock2', 10) |

+----------------------------------------------------------------+

| 1 |

+----------------------------------------------------------------+

In this case, the lock identifiers are **(mynamespace, wlock1)** and **(mynamespace, wlock2)**.

To release all locks for a namespace, use this function:

mysql> **SELECT service\_release\_locks('mynamespace');**

+--------------------------------------+

| service\_release\_locks('mynamespace') |

+--------------------------------------+

| 1 |

+--------------------------------------+

Each locking function returns nonzero for success. If the function fails, an error occurs. For example, the following error occurs because lock names cannot be empty:

mysql> **SELECT service\_get\_read\_locks('mynamespace', '', 10);**

ERROR 3131 (42000): Incorrect locking service lock name ''.

A session can acquire multiple locks for the same lock identifier. As long as a different session does not have a write lock for an identifier, the session can acquire any number of read or write locks. Each lock request for the identifier acquires a new lock. The following statements acquire three write locks with the same identifier, then three read locks for the same identifier:

SELECT service\_get\_write\_locks('ns', 'lock1', 'lock1', 'lock1', 0);

SELECT service\_get\_read\_locks('ns', 'lock1', 'lock1', 'lock1', 0);

If you examine the Performance Schema **metadata\_locks** table at this point, you should find that the session holds six distinct locks with the same **(ns, lock1)** identifier. (For details, see [Locking Service Monitoring](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#locking-service-monitoring).)

Because the session holds at least one write lock on **(ns, lock1)**, no other session can acquire a lock for it, either read or write. If the session held only read locks for the identifier, other sessions could acquire read locks for it, but not write locks.

Locks for a single lock-acquisition call are acquired atomically, but atomicity does not hold across calls. Thus, for a statement such as the following, where **[service\_get\_write\_locks()](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "function_service-get-write-locks)** is called once per row of the result set, atomicity holds for each individual call, but not for the statement as a whole:

SELECT service\_get\_write\_locks('ns', 'lock1', 'lock2', 0) FROM t1 WHERE ... ;

**Caution**

Because the locking service returns a separate lock for each successful request for a given lock identifier, it is possible for a single statement to acquire a large number of locks. For example:

INSERT INTO ... SELECT service\_get\_write\_locks('ns', t1.col\_name, 0) FROM t1;

These types of statements may have certain adverse effects. For example, if the statement fails part way through and rolls back, locks acquired up to the point of failure still exist. If the intent is for there to be a correspondence between rows inserted and locks acquired, that intent is not satisfied. Also, if it is important that locks are granted in a certain order, be aware that result set order may differ depending on which execution plan the optimizer chooses. For these reasons, it may be best to limit applications to a single lock-acquisition call per statement.

###### Locking Service监控

The locking service is implemented using the MySQL Server metadata locks framework, so you monitor locking service locks acquired or waited for by examining the Performance Schema **metadata\_locks** table.

First, enable the metadata lock instrument:

mysql> **UPDATE performance\_schema.setup\_instruments SET ENABLED = 'YES'**

-> **WHERE NAME = 'wait/lock/metadata/sql/mdl';**

Then acquire some locks and check the contents of the **metadata\_locks** table:

mysql> **SELECT service\_get\_write\_locks('mynamespace', 'lock1', 0);**

+----------------------------------------------------+

| service\_get\_write\_locks('mynamespace', 'lock1', 0) |

+----------------------------------------------------+

| 1 |

+----------------------------------------------------+

mysql> **SELECT service\_get\_read\_locks('mynamespace', 'lock2', 0);**

+---------------------------------------------------+

| service\_get\_read\_locks('mynamespace', 'lock2', 0) |

+---------------------------------------------------+

| 1 |

+---------------------------------------------------+

mysql> **SELECT OBJECT\_TYPE, OBJECT\_SCHEMA, OBJECT\_NAME, LOCK\_TYPE, LOCK\_STATUS**

-> **FROM performance\_schema.metadata\_locks**

-> **WHERE OBJECT\_TYPE = 'LOCKING SERVICE'\G**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

OBJECT\_TYPE: LOCKING SERVICE

OBJECT\_SCHEMA: mynamespace

OBJECT\_NAME: lock1

LOCK\_TYPE: EXCLUSIVE

LOCK\_STATUS: GRANTED

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 2. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

OBJECT\_TYPE: LOCKING SERVICE

OBJECT\_SCHEMA: mynamespace

OBJECT\_NAME: lock2

LOCK\_TYPE: SHARED

LOCK\_STATUS: GRANTED

锁定服务锁有一个OBJECT\_TYPE值为LOCKING SERVICE。这与例如用GET\_LOCK()函数获得的锁不同，后者的OBJECT\_TYPE是USER LEVEL LOCK。

锁的命名空间、名称和模式出现在OBJECT\_SCHEMA、OBJECT\_NAME和LOCK\_TYPE列。读取和写入锁的LOCK\_TYPE值分别为SHARED和EXCLUSIVE。

LOCK\_STATUS的值对于一个已经获得的锁是GRANTED，对于一个正在等待的锁是PENDING。如果一个会话持有一个写锁，而另一个会话正试图获得一个具有相同标识符的锁，你可以期望看到PENDING。

###### Locking Service Interface函数指南

锁定服务的SQL接口实现了本节中描述的可加载函数。关于使用例子，请看使用锁定服务函数接口。

这些函数有以下特点。

- 成功时返回值为非零。否则，会发生错误。

- 名称空间和锁的名称必须是非NULL，非空的，并且最大长度为64个字符。

- 超时值必须是整数，表明在出错放弃之前要等待多少秒来获取锁。如果超时值为0，则不需要等待，如果不能立即获得锁，该函数会产生一个错误。

这些锁服务函数是可用的。

- service\_get\_read\_locks(namespace, lock\_name[, lock\_name] ..., timeout)

使用给定的锁名在给定的名字空间中获取一个或多个读（共享）锁，如果在给定的超时值内没有获取锁，则会出现错误。

- service\_get\_write\_locks(namespace, lock\_name[, lock\_name] ..., timeout)

使用给定的锁名在给定的命名空间中获取一个或多个写（独占）锁，如果在给定的超时值内没有获取锁，则会出现超时错误。

- service\_release\_locks(namespace)

对于给定的命名空间，释放所有在当前会话中使用service\_get\_read\_locks()和service\_get\_write\_locks()获得的锁。

如果命名空间中没有锁，这并不是一个错误。

#### 5.6.9.2  Keyring 服务

MySQL服务器支持一个钥匙圈服务，使内部组件和插件能够安全地存储敏感信息以便日后检索。MySQL发行版提供了一个钥匙圈接口，可以在两个层面上访问。

- 在SQL层面，作为一组可加载的函数，每个函数都映射到对服务例程的调用。

- 作为一个C语言接口，可作为一个插件服务从服务器插件或可加载函数调用。

本节描述了如何使用钥匙圈服务函数来存储、检索和删除MySQL钥匙圈钥匙库中的钥匙。关于使用函数的SQL接口的信息，请参见第6.4.4.14节，"通用钥匙圈钥匙管理函数"。关于一般的钥匙圈信息，见第6.4.4节，"MySQL钥匙圈"。

钥匙圈服务使用任何已启用的基础钥匙圈插件（如果有的话）。如果没有启用钥匙圈插件，则钥匙圈服务调用失败。

钥匙库中的一条 "记录 "由数据（钥匙本身）和一个唯一的标识符组成，通过这个标识符可以访问钥匙。该标识符有两部分。

- key\_id。以mysql\_开头的key\_id值是由MySQL服务器保留的。

- user\_id。会话的有效用户ID。如果没有用户背景，这个值可以是NULL。该值实际上不需要是一个 "用户"；其含义取决于应用程序。

实现keyring函数接口的函数将CURRENT\_USER()的值作为user\_id值传递给keyring服务函数。

密钥环服务函数有这些共同的特点。

- 每个函数成功时返回0，失败时返回1。

- key\_id和user\_id参数形成一个唯一的组合，表明要使用钥匙圈中的哪把钥匙。

- key\_type参数提供了关于钥匙的额外信息，例如它的加密方法或预期用途。

- Keyring服务函数将钥匙ID、用户名、类型和值视为二进制字符串，因此比较是区分大小写的。例如，MyKey和mykey的ID指的是不同的钥匙。

这些钥匙圈服务函数是可用的。

- my\_key\_fetch()

解除混淆并从钥匙圈中获取一把钥匙，以及它的类型。该函数为用于存储返回的钥匙和钥匙类型的缓冲区分配了内存。当不再需要这些内存时，调用者应将其清零或混淆，然后释放它。

语法。

bool my\_key\_fetch(const char \*key\_id, const char \*\*key\_type,

const char\* user\_id, void \*\*key, size\_t \*key\_len)

参数。

o key\_id, user\_id: 空尾的字符串，作为一对形成一个唯一的标识符，表示要获取的密钥。

o key\_type。缓冲区指针的地址。该函数在其中存储了一个指向空尾字符串的指针，该字符串提供了关于该钥匙的额外信息（在添加钥匙时存储）。

o key。一个缓冲区指针的地址。该函数在其中存储了一个指向包含所获取的密钥数据的缓冲区的指针。

o key\_len: 一个变量的地址，函数在其中存储了\*key缓冲区的字节大小。

返回值。

成功时返回0，失败时返回1。

- my\_key\_generate()

生成一个给定类型和长度的新的随机密钥，并将其存储在钥匙圈中。该钥匙的长度为key\_len，并与由key\_id和user\_id形成的标识符相关联。类型和长度值必须与底层钥匙圈插件所支持的值一致。参见第6.4.4.12节，"支持的钥匙圈钥匙类型和长度"。

语法。

bool my\_key\_generate(const char \*key\_id, const char \*key\_type,

const char \*user\_id, size\_t key\_len)

参数。

o key\_id, user\_id: 以空值为结尾的字符串，这一对字符串构成了要生成的钥匙的唯一标识符。

o key\_type。一个空尾的字符串，提供关于钥匙的额外信息。

o key\_len: 要生成的密钥的字节大小。

返回值。

成功时返回0，失败时返回1。

- my\_key\_remove()

从钥匙圈中删除一把钥匙。

语法。

bool my\_key\_remove(const char \*key\_id, const char\* user\_id)

参数。

o key\_id, user\_id: 以空值结尾的字符串，作为一对形成要删除的钥匙的唯一标识符。

返回值。

成功时返回0，失败时返回1。

- my\_key\_store()

混淆并在钥匙圈中存储一把钥匙。

语法。

bool my\_key\_store(const char \*key\_id, const char \*key\_type,

const char\* user\_id, void \*key, size\_t key\_len)

参数。

o key\_id, user\_id: 以空值为结尾的字符串，作为一对形成要存储的密钥的唯一标识符。

o key\_type。一个空尾的字符串，提供关于钥匙的额外信息。

o key。包含要存储的密钥数据的缓冲区。

o key\_len: 密钥缓冲区的大小（字节）。

返回值。

成功时返回0，失败时返回1。

## 5.7 MySQL服务器可加载函数

5.7.1 安装和卸载可加载函数

5.7.2 获取关于可加载函数的信息

MySQL支持可加载函数，即不是内建的函数，但可以在运行时加载（在启动时或之后）以扩展服务器能力，或卸载以移除能力。关于描述可用的可加载函数的表格，见第12.2节，"可加载函数参考"。可加载函数与内置（本地）函数形成对比，后者是作为服务器的一部分实现的，并且总是可用的；关于表格，请参见第12.1节，"内置函数和操作符参考"。

注意

可加载函数以前被称为用户定义的函数（UDFs）。这个术语有些名不副实，因为 "用户定义 "也可以适用于其他类型的函数，如存储函数（一种使用SQL编写的存储对象）和通过修改服务器源代码添加的本地函数。

MySQL发行版包括全部或部分实现这些服务器功能的可加载函数。

- 组复制使你能够在一组MySQL服务器实例中创建一个高可用的分布式MySQL服务，其数据一致性、冲突检测和解决以及组成员服务都是内置的。参见第18章，组复制。

- MySQL企业版包括基于OpenSSL库执行加密操作的功能。参见第6.6节，"MySQL企业版加密"。

- MySQL企业版包括为屏蔽和去标识操作提供SQL级API的函数。参见第6.5.1节，"MySQL企业版数据屏蔽和去识别元素"。

- MySQL企业版包括用于监测和记录连接和查询活动的审计日志。参见第6.4.5节 "MySQL企业审计 "和第6.4.6节 "审计消息组件"。

- MySQL企业版包括一个防火墙功能，它实现了一个应用级防火墙，使数据库管理员能够根据与所接受的语句模式的匹配来允许或拒绝SQL语句的执行。见第6.4.7节，"MySQL企业版防火墙"。

- 查询改写器检查MySQL服务器收到的语句，并可能在服务器执行这些语句之前对其进行改写。参见第5.6.4节，"重写器查询重写插件"

- 版本令牌能够创建和同步服务器令牌，应用程序可以使用这些令牌来防止访问不正确或过时的数据。参见第5.6.6节，"版本令牌"。

- MySQL密钥环为敏感信息提供安全存储。参见第6.4.4节，"MySQL钥匙圈"。

- 锁定服务提供了一个锁定接口供应用程序使用。参见第5.6.9.1节，"锁定服务"。

- 一个函数提供对查询属性的访问。参见第9.6节，"查询属性"。

下面几节描述了如何安装和卸载可加载函数，以及如何在运行时确定哪些可加载函数被安装并获得有关它们的信息。

在某些情况下，可加载函数是通过安装实现该函数的组件来加载的，而不是通过直接加载该函数。关于某个特定的可加载函数的细节，请参见包含该函数的服务器功能的安装说明。

有关编写可加载函数的信息，请参阅向MySQL添加函数。

### 5.7.1 安装和卸载可加载函数

顾名思义，可加载函数在使用前必须被加载到服务器中。MySQL支持在服务器启动时自动加载函数，之后再手动加载。

当一个可加载的函数被加载时，关于它的信息可在第5.7.2节 "获取可加载函数的信息 "中描述。

- 安装可加载的功能

- 卸载可加载的功能

- 重新安装或升级可加载的功能

安装可加载的功能

要手动加载一个可加载函数，请使用CREATE FUNCTION语句。例如。

CREATE FUNCTION metaphon

RETURNS STRING

SONAME 'udf\_example.so'。

文件的基础名称取决于你的平台。常见的后缀是Unix和类Unix系统为.so，Windows为.dll。

CREATE FUNCTION有这些作用。

- 它将函数加载到服务器中，使其立即可用。

- 它在mysql.func系统表中注册该函数，使其在服务器重新启动时持续存在。由于这个原因，CREATE FUNCTION需要mysql系统数据库的INSERT权限。

- 它将函数添加到Performance Schema user\_defined\_functions表中，该表提供关于已安装的可加载函数的运行时间信息。参见章节5.7.2, "获取可加载函数的信息"。

可加载函数的自动加载发生在正常的服务器启动序列中。

- 在mysql.func表中注册的函数被安装。

- 在启动时安装的组件或插件可能会自动安装相关函数。

- 自动函数安装将函数添加到Performance Schema user\_defined\_functions表中，该表提供关于已安装函数的运行时信息。

如果服务器以--skip-grant-tables选项启动，在mysql.func表中注册的函数就不会被加载，并且不可用。这不适用于由组件或插件自动安装的函数。

#### Uninstalling Loadable Functions

要删除一个可加载的函数，使用DROP FUNCTION语句。例如。

DROP FUNCTION metaphon;

DROP FUNCTION有这些作用。

- 它卸载了该函数，使其不可用。

- 它从mysql.func系统表中删除该函数。由于这个原因，DROP FUNCTION需要mysql系统数据库的DELETE权限。由于函数不再在mysql.func表中注册，服务器在随后的重新启动中不会加载该函数。

- 它从Performance Schema user\_defined\_functions表中删除该函数，该表提供关于已安装的可加载函数的运行时间信息。

DROP FUNCTION不能用来放弃一个由组件或插件自动安装的可加载函数，而不是通过使用CREATE FUNCTION。当安装该函数的组件或插件被卸载时，这样的函数也会被自动放弃。

#### Reinstalling or Upgrading Loadable Functions

要重新安装或升级与可加载函数相关的共享库，请发布DROP FUNCTION语句，升级共享库，然后再发布CREATE FUNCTION语句。如果你先升级共享库，然后使用DROP FUNCTION，服务器可能会意外地关闭。

### 5.7.2 获取可加载函数信息

Performance Schema user\_defined\_functions表包含了关于当前安装的可加载函数的信息。

SELECT \* FROM performance\_schema.user\_defined\_functions。

mysql.func系统表也列出了已安装的可加载函数，但只有那些使用CREATE FUNCTION安装的函数。user\_defined\_functions表列出了使用CREATE FUNCTION安装的可加载函数，以及由组件或插件自动安装的可加载函数。这个区别使得user\_defined\_functions比mysql.func更适合用来检查哪些可加载函数被安装。参见第27.12.21.8节，"user\_defined\_functions表"。

## 5.8 在一台机器上运行多个MySQL实例

5.8.1 设置多个数据目录

5.8.2 在Windows上运行多个MySQL实例

5.8.3 在Unix上运行多个MySQL实例

5.8.4 在多服务器环境中使用客户端程序

在某些情况下，你可能想在一台机器上运行多个MySQL实例。你可能想测试一个新的MySQL版本，同时让现有的生产设置不受干扰。或者你可能想让不同的用户访问他们自己管理的不同的mysqld服务器。(例如，你可能是一个互联网服务提供商，希望为不同的客户提供独立的MySQL安装。)

可以为每个实例使用不同的MySQL服务器二进制文件，或为多个实例使用相同的二进制文件，或这两种方法的任何组合。例如，你可以运行一个来自MySQL 5.7的服务器和一个来自MySQL 8.0的服务器，以查看不同版本如何处理给定的工作负载。或者你可以运行当前生产版本的多个实例，每个实例管理一组不同的数据库。

无论你是否使用不同的服务器二进制文件，你所运行的每个实例都必须为几个操作参数配置独特的值。这消除了实例之间发生冲突的可能性。参数可以在命令行、选项文件中或通过设置环境变量来设置。见第4.2.2节，"指定程序选项"。要查看一个给定实例使用的值，可以连接到它并执行SHOW VARIABLES语句。

由MySQL实例管理的主要资源是数据目录。每个实例应使用不同的数据目录，其位置用-datadir=dir\_name选项指定。关于用自己的数据目录配置每个实例的方法，以及关于不这样做的危险的警告，见5.8.1节 "设置多个数据目录"。

除了使用不同的数据目录外，其他几个选项对于每个服务器实例必须有不同的值。

--port=port\_num

--port控制TCP/IP连接的端口号。另外，如果主机有多个网络地址，你可以设置bind\_address系统变量，使每个服务器监听不同的地址。

--socket={file\_name|pipe\_name}。

--socket在Unix上控制Unix套接字文件路径，在Windows上控制命名管道名称。在Windows上，只有那些被配置为允许命名管道连接的服务器，才有必要指定不同的管道名称。

--shared-memory-base-name=name

这个选项只在Windows下使用。它指定了Windows服务器所使用的共享内存名称，以允许客户使用共享内存进行连接。只有那些被配置为允许共享内存连接的服务器才有必要指定不同的共享内存名称。

-pid-file=file\_name

这个选项表示服务器写入其进程ID的文件的路径名称。

如果你使用下列日志文件选项，它们的值在每台服务器上必须不同。

--general\_log\_file=file\_name

--log-bin[=file\_name] 。

--slow\_query\_log\_file=file\_name

--log-error[=file\_name]。

关于日志文件选项的进一步讨论，见第5.4节 "MySQL服务器日志"。

为了获得更好的性能，你可以为每台服务器不同地指定以下选项，以便在几个物理磁盘之间分散负载。

--tmpdir=dir\_name

拥有不同的临时目录也可以更容易地确定哪个MySQL服务器创建了任何特定的临时文件。

如果你在不同的地方有多个MySQL安装，你可以用-basedir=dir\_name选项为每个安装指定基础目录。这将导致每个实例自动使用不同的数据目录、日志文件和PID文件，因为这些参数的默认值是相对于基础目录的。在这种情况下，你唯一需要指定的其他选项是--socket和--port选项。假设你使用tar文件的二进制分发来安装不同版本的MySQL。这些安装在不同的位置，所以你可以使用bin/mysqld\_safe命令在其相应的基础目录下启动每个安装的服务器。mysqld\_safe决定了传递给mysqld的适当的-basedir选项，你只需要向mysqld\_safe指定-socket和-port选项。

正如下面几节所讨论的，可以通过指定适当的命令选项或设置环境变量来启动其他服务器。然而，如果你需要更长期地运行多个服务器，使用选项文件为每个服务器指定那些必须是它独有的选项值会更方便。--defaults-file选项对这个目的很有用。

### 5.8.1 设置多个数据目录

一台机器上的每个MySQL实例应该有自己的数据目录。使用-datadir=dir\_name选项来指定该位置。

有不同的方法为一个新的实例设置数据目录。

- 创建一个新的数据目录。

- 复制一个现有的数据目录。

下面的讨论提供了关于每种方法的更多细节。

警告

通常情况下，你不应该有两个服务器在同一个数据库中更新数据。如果你的操作系统不支持无故障系统锁定，这可能导致不愉快的意外。如果（尽管有这个警告）你使用同一个数据目录运行多个服务器，并且它们都启用了日志记录功能，你必须使用适当的选项来指定每个服务器所特有的日志文件名。否则，这些服务器会试图记录到相同的文件。

即使遵守了前面的预防措施，这种设置也只适用于MyISAM和MERGE表，而不适用于任何其他的存储引擎。另外，这个反对在服务器之间共享数据目录的警告总是适用于NFS环境。允许多个MySQL服务器通过NFS访问一个共同的数据目录是一个非常糟糕的主意。主要问题是，NFS是速度瓶颈。它不是为这种用途而设的。NFS的另一个风险是，你必须设计一种方法来确保两个或更多的服务器不会互相干扰。通常NFS的文件锁定是由lockd守护进程处理的，但目前还没有一个平台能在任何情况下100%可靠地执行锁定。

#### Create a New Data Directory

用这种方法，数据目录的状态与你第一次安装MySQL时相同，并且有默认的MySQL账户集和没有用户数据。

在Unix中，初始化数据目录。见第2.10节，"安装后的设置和测试"。

在Windows中，数据目录包含在MySQL分发包中。

- 用于Windows的MySQL Zip压缩包发行版包含一个未修改的数据目录。你可以将这样的分发包解压到一个临时位置，然后将其数据目录复制到你设置新实例的地方。

- Windows MSI包安装程序创建并设置了所安装服务器使用的数据目录，但也在安装目录下创建了一个原始的名为data的 "模板 "数据目录。在使用MSI包进行安装后，可以复制模板数据目录来设置其他MySQL实例。

#### Copy an Existing Data Directory

使用这种方法，数据目录中存在的任何MySQL账户或用户数据都会被转移到新的数据目录中。

1. 1. 停止使用数据目录的现有MySQL实例。这必须是一次干净的关机，以便实例将任何待定的更改刷到磁盘上。

2. 2.将数据目录复制到新的数据目录所在的位置。

3. 复制现有实例使用的 my.cnf 或 my.ini 选项文件。这可以作为新实例的基础。

4. 4.修改新的选项文件，使任何引用原始数据目录的路径名都指向新的数据目录。同时，修改任何其他必须在每个实例中唯一的选项，比如TCP/IP端口号和日志文件。关于每个实例必须是唯一的参数列表，见第5.8节 "在一台机器上运行多个MySQL实例"。

5. 5.启动新的实例，告诉它使用新的选项文件

### 5.8.2 Windows服务器上运行多个MySQL实例

5.8.2.1 在Windows命令行启动多个MySQL实例

5.8.2.2 作为Windows服务启动多个MySQL实例

你可以在Windows上运行多个服务器，从命令行手动启动它们，每个都有适当的操作参数，或者将几个服务器安装为Windows服务并以这种方式运行它们。从命令行或作为服务运行MySQL的一般说明在第2.3节 "在Microsoft Windows上安装MySQL "中给出。下面几节描述了如何用不同的值来启动每台服务器，这些选项必须在每台服务器上是唯一的，例如数据目录。这些选项在第5.8节 "在一台机器上运行多个MySQL实例 "中列出。

#### 5.8.2.1 Starting Multiple MySQL Instances at the Windows Command Line

从命令行手动启动单个MySQL服务器的过程在第2.3.4.6节 "从Windows命令行启动MySQL "中描述。要以这种方式启动多个服务器，你可以在命令行或选项文件中指定适当的选项。将选项放在选项文件中更为方便，但有必要确保每台服务器得到自己的选项集。要做到这一点，为每个服务器创建一个选项文件，并在运行时用-defaults-file选项告诉服务器文件名。

假设你想在3307端口运行一个mysqld实例，数据目录为C:\mydata1，另一个实例在3308端口，数据目录为C:\mydata2。使用此程序。

1. 确保每个数据目录都存在，包括它自己的包含授予表的mysql数据库的副本。

2. 2.创建两个选项文件。例如，创建一个名为C:\my-opts1.cnf的文件，看起来像这样。

1. [mysqld]
2. datadir = C:/mydata1
3. port = 3307

Create a second file named C:\my-opts2.cnf that looks like this:

[mysqld]

datadir = C:/mydata2

port = 3308

1. Use the [--defaults-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#option_general_defaults-file) option to start each server with its own option file:
2. C:\> **C:\mysql\bin\mysqld --defaults-file=C:\my-opts1.cnf**
3. C:\> **C:\mysql\bin\mysqld --defaults-file=C:\my-opts2.cnf**

每台服务器都在前台启动（在服务器退出之前不会出现新的提示），所以你需要在不同的控制台窗口中发出这两条命令。

要关闭服务器，使用适当的端口号连接到每个服务器。

C:\> **C:\mysql\bin\mysqladmin --port=3307 --host=127.0.0.1 --user=root --password shutdown**

C:\> **C:\mysql\bin\mysqladmin --port=3308 --host=127.0.0.1 --user=root --password shutdown**

如上所述配置的服务器允许客户通过TCP/IP进行连接。如果你的Windows版本支持命名的管道，并且你也想允许命名的管道连接，请指定启用命名管道的选项并指定其名称。每个支持命名管道连接的服务器必须使用一个唯一的管道名称。例如，C:\my-opts1.cnf文件可以这样写。

[mysqld]

datadir = C:/mydata1

port = 3307

enable-named-pipe

socket = mypipe1

类似地修改C:\my-opts2.cnf，供第二个服务器使用。然后如前所述启动服务器。

类似的程序适用于你想允许共享内存连接的服务器。通过启用shared\_memory系统变量来启动服务器，并通过设置shared\_memory\_base\_name系统变量为每台服务器指定一个独特的共享内存名称，从而启用这种连接。

#### 5.8.2.2 Starting Multiple MySQL Instances as Windows Services

在Windows上，MySQL服务器可以作为一个Windows服务运行。安装、控制和删除单个MySQL服务的程序在第2.3.4.8节 "作为Windows服务启动MySQL "中描述。

要设置多个MySQL服务，你必须确保每个实例使用不同的服务名称，此外还有其他参数，每个实例必须是唯一的。

对于下面的说明，假设你想从两个不同版本的MySQL中运行mysqld服务器，它们分别安装在C:\mysql-5.7.9和C:\mysql-8.0.25。(如果你正在运行5.7.9作为你的生产服务器，但也想使用8.0.25进行测试，可能就是这种情况)。

要将MySQL安装为Windows服务，请使用--install或--install-manual选项。关于这些选项的信息，见第2.3.4.8节 "作为Windows服务启动MySQL"。

基于前面的信息，你有几种方法来设置多个服务。下面的说明描述了一些例子。在尝试其中任何一种之前，请关闭并删除任何现有的MySQL服务。

- 方法1：在一个标准选项文件中指定所有服务的选项。要做到这一点，为每个服务器使用不同的服务名称。假设你想使用mysqld1的服务名称运行5.7.9 mysqld，使用mysqld2的服务名称运行8.0.25 mysqld。在这种情况下，你可以为5.7.9使用[mysqld1]组，为8.0.25使用[mysqld2]组。例如，你可以像这样设置C:\my.cnf。

* # options for mysqld1 service
* [mysqld1]
* basedir = C:/mysql-5.7.9
* port = 3307
* enable-named-pipe
* socket = mypipe1
* # options for mysqld2 service
* [mysqld2]
* basedir = C:/mysql-8.0.25
* port = 3308
* enable-named-pipe
* socket = mypipe2

按以下方式安装服务，使用完整的服务器路径名称，以确保Windows为每个服务注册正确的可执行程序。

C:\> **C:\mysql-5.7.9\bin\mysqld --install mysqld1**

C:\> **C:\mysql-8.0.25\bin\mysqld --install mysqld2**

要启动服务，请使用服务管理器，或使用适当的服务名称的NET START或SC START。

C:\> **SC START mysqld1**

C:\> **SC START mysqld2**

要停止服务，请使用服务管理器，或使用NET STOP或SC STOP与适当的服务名称。

C:\> **SC STOP mysqld1**

C:\> **SC STOP mysqld2**

***- 方法2：在单独的文件中为每个服务器指定选项，并在安装服务时使用--defaults-file来告诉每个服务器使用什么文件。在这种情况下，每个文件应该使用[mysqld]组列出选项。***

***使用这种方法，为了指定5.7.9 mysqld的选项，创建一个文件C:\my-opts1.cnf，看起来像这样。***

[mysqld]

basedir = C:/mysql-5.7.9

port = 3307

enable-named-pipe

socket = mypipe1

For the 8.0.25 **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**, create a file C:\my-opts2.cnf that looks like this:

[mysqld]

basedir = C:/mysql-8.0.25

port = 3308

enable-named-pipe

socket = mypipe2

Install the services as follows (enter each command on a single line):

C:\> **C:\mysql-5.7.9\bin\mysqld --install mysqld1**

**--defaults-file=C:\my-opts1.cnf**

C:\> **C:\mysql-8.0.25\bin\mysqld --install mysqld2**

**--defaults-file=C:\my-opts2.cnf**

当你把MySQL服务器安装为服务并使用-defaults-file选项时，服务名称必须在该选项之前。

在安装服务后，启动和停止它们的方法与前面的例子相同。

要删除多个服务，对每个服务使用SC DELETE mysqld\_service\_name。或者，对每个服务使用 mysqld --remove，在 --remove 选项后面指定一个服务名称。如果服务名称是默认的(MySQL)，你可以在使用mysqld --remove时省略它。

### 5.8.3 unix服务器上运行多个MySQL实例

**Note**

这里的讨论使用mysqld\_safe来启动MySQL的多个实例。对于使用RPM发行版的MySQL安装，服务器的启动和关闭在几个Linux平台上由systemd管理。在这些平台上，mysqld\_safe没有被安装，因为它是不必要的。关于使用systemd处理多个MySQL实例的信息，见2.5.9节 "用systemd管理MySQL服务器"。

在Unix上运行多个MySQL实例的一个方法是，用不同的默认TCP/IP端口和Unix套接字文件编译不同的服务器，使每个服务器都在不同的网络接口上监听。为每一个安装在不同的基础目录下进行编译，也会自动导致每一个服务器有一个单独的、编译后的数据目录、日志文件和PID文件位置。

假设一个现有的5.7服务器被配置为默认的TCP/IP端口号（3306）和Unix套接字文件（/tmp/mysql.sock）。要配置一个新的8.0.25服务器，使其具有不同的操作参数，请使用类似这样的CMake命令。

shell> **cmake . -DMYSQL\_TCP\_PORT=*port\_number* \**

**-DMYSQL\_UNIX\_ADDR=*file\_name* \**

**-DCMAKE\_INSTALL\_PREFIX=/usr/local/mysql-8.0.25**

这里，port\_number和file\_name必须与默认的TCP/IP端口号和Unix套接字文件路径名不同，而且CMAKE\_INSTALL\_PREFIX值应该指定一个与现有MySQL安装所在目录不同的安装目录。

如果你有一个MySQL服务器在一个给定的端口号上监听，你可以使用下面的命令来找出它在几个重要的可配置变量上使用的操作参数，包括基础目录和Unix套接字文件名。

shell> **mysqladmin --host=*host\_name* --port=*port\_number* variables**

通过该命令显示的信息，你可以知道在配置一个额外的服务器时不使用哪些选项值。

如果你指定localhost作为主机名，mysqladmin默认使用Unix套接字文件而不是TCP/IP。要明确指定传输协议，使用 --protocol={TCP|SOCKET|PIPE|MEMORY}选项。

你不需要为了使用不同的Unix套接字文件和TCP/IP端口号而编译一个新的MySQL服务器。也可以使用相同的服务器二进制文件，并在运行时以不同的参数值启动它的每个调用。这样做的一个方法是使用命令行选项。

shell> **mysqld\_safe --socket=*file\_name* --port=*port\_number***

要启动第二个服务器，提供不同的 --socket 和 --port 选项值，并向 mysqld\_safe 传递一个 --datadir=dir\_name 选项，以便服务器使用一个不同的数据目录。

或者，把每个服务器的选项放在一个不同的选项文件中，然后使用--defaults-file选项启动每个服务器，该选项指定了适当的选项文件的路径。例如，如果两个服务器实例的选项文件被命名为/usr/local/mysql/my.cnf和/usr/local/mysql/my.cnf2，那么像这样启动服务器：命令。

shell> **mysqld\_safe --defaults-file=/usr/local/mysql/my.cnf**

shell> **mysqld\_safe --defaults-file=/usr/local/mysql/my.cnf2**

另一种达到类似效果的方法是使用环境变量来设置Unix套接字文件名和TCP/IP端口号。

shell> **MYSQL\_UNIX\_PORT=/tmp/mysqld-new.sock**

shell> **MYSQL\_TCP\_PORT=3307**

shell> **export MYSQL\_UNIX\_PORT MYSQL\_TCP\_PORT**

shell> **bin/mysqld --initialize --user=mysql**

shell> **mysqld\_safe --datadir=/path/to/datadir &**

这是一个快速启动第二个服务器用于测试的方法。这个方法的好处是，环境变量的设置适用于你从同一个shell调用的任何客户端程序。因此，这些客户端的连接会自动被引导到第二个服务器。

第4.9节 "环境变量"，包括一个你可以用来影响MySQL程序的其他环境变量的列表。

在Unix上，mysqld\_multi脚本提供了另一种启动多个服务器的方法。见第4.3.4节，"mysqld\_multi - 管理多个MySQL服务器"。

### 5.8.4 在多服务器环境中使用MySQL 客户端

要用客户端程序连接到监听不同网络接口的MySQL服务器，而这些网络接口与编译到客户端的网络接口不同，你可以使用以下方法之一。

- 用--host=host\_name --port=port\_number启动客户端，用TCP/IP连接到远程服务器，用--host=127.0.0.1 --port=port\_number连接到本地服务器，或者用--host=localhost --socket=file\_name连接到本地服务器，使用Unix套接字文件或Windows命名管道。

- 用--protocol=TCP来启动客户端，使用TCP/IP进行连接；--protocol=SOCKET，使用Unix套接字文件进行连接；--protocol=PIPE，使用命名管道进行连接；或者--protocol=MEMORY，使用共享内存进行连接。对于TCP/IP连接，你可能还需要指定--host和--port选项。对于其他类型的连接，你可能需要指定--socket选项来指定Unix套接字文件或Windows命名管道名称，或者--shared-memory-base-name选项来指定共享内存名称。共享内存连接只在Windows上被支持。

- 在Unix上，在启动客户端之前，设置MYSQL\_UNIX\_PORT和MYSQL\_TCP\_PORT环境变量，使其指向Unix套接字文件和TCP/IP端口号。如果你通常使用一个特定的套接字文件或端口号，你可以把设置这些环境变量的命令放在你的.login文件中，这样它们就会在你每次登录的时候适用。参见第4.9节，"环境变量"。

- 在选项文件的[client]组中指定默认的Unix socket文件和TCP/IP端口号。例如，你可以在Windows上使用C:\my.cnf，或者在Unix上使用你主目录下的.my.cnf文件。见第4.2.2.2节，"使用选项文件"。

- 在C程序中，你可以在mysql\_real\_connect()调用中指定套接字文件或端口号参数。你也可以通过调用mysql\_options()让程序读取选项文件。参见C API基本功能描述。

- 如果你使用Perl DBD::mysql模块，你可以从MySQL选项文件读取选项。比如说

* $dsn = "DBI:mysql:test;mysql\_read\_default\_group=client;"
* . "mysql\_read\_default\_file=/usr/local/mysql/data/my.cnf";
* $dbh = DBI->connect($dsn, $user, $password);

See [Section 29.9, “MySQL Perl API”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\connectors-apis.html#apis-perl).

Other programming interfaces may provide similar capabilities for reading option files.

## 5.9 调试MySQL

5.9.1 调试MySQL服务器

5.9.2 调试一个MySQL客户端

5.9.3 LOCK\_ORDER工具

5.9.4 DBUG包

本节介绍了有助于追踪MySQL中问题的调试技术。

### 5.9.1 调试MySQL服务器

5.9.1.1 编译用于调试的MySQL

5.9.1.2 创建跟踪文件

5.9.1.3 使用WER和PDB来创建Windows crashdump

5.9.1.4 在gdb下调试mysqld

5.9.1.5 使用堆栈跟踪

5.9.1.6 使用服务器日志查找mysqld中错误的原因

5.9.1.7 如果你遇到表损坏，制作一个测试案例

如果你正在使用一些在MySQL中非常新的功能，你可以尝试用--skip-new选项运行mysqld（它禁用所有新的、可能不安全的功能）。见B.3.3.3节，"如果MySQL一直崩溃该怎么办"。

如果mysqld不想启动，确认你没有干扰你设置的my.cnf文件！你可以检查你的my.cnf文件。你可以用mysqld --print-defaults检查你的my.cnf参数，并通过用mysqld --no-defaults启动避免使用它们 ....

如果mysqld开始占用CPU或内存，或者它 "挂起"，你可以使用mysqladmin processlist status来发现是否有人正在执行一个需要很长时间的查询。如果遇到性能问题或新客户无法连接的问题，在某个窗口运行mysqladmin -i10 processlist status可能是个好主意。

mysqladmin debug命令将一些关于正在使用的锁、使用的内存和查询使用的信息转储到MySQL日志文件中。这可能有助于解决一些问题。即使你没有为调试而编译MySQL，该命令也提供了一些有用的信息!

如果问题是某些表变得越来越慢，你应该尝试用OPTIMIZE TABLE或myisamchk来优化该表。见第5章，MySQL服务器管理。你还应该用EXPLAIN检查缓慢的查询。

你还应该阅读本手册中针对操作系统的部分，以了解可能是你的环境所特有的问题。见第2.1节，"一般安装指导"。

#### 5.9.1.1 编译用于调试的MySQL

如果你有一些非常具体的问题，你总是可以尝试调试MySQL。要做到这一点，你必须用-DWITH\_DEBUG=1选项配置MySQL。你可以通过执行以下操作来检查MySQL是否被编译为带有调试功能： mysqld --help。如果--debug标志与选项一起列出，那么你已经启用了调试。mysqladmin ver也列出了mysqld的版本为mysql ... --debug，在这种情况下。

如果当你用-DWITH\_DEBUG=1 CMake选项配置时，mysqld停止崩溃，你可能已经发现了一个编译器错误或MySQL内部的计时错误。在这种情况下，你可以尝试使用CMAKE\_C\_FLAGS和CMAKE\_CXX\_FLAGS CMake选项添加-g，而不要使用-DWITH\_DEBUG=1。如果mysqld死了，你至少可以用gdb附加到它，或者在核心文件上使用gdb来找出发生了什么。

当你为调试配置MySQL时，你自动启用了很多额外的安全检查函数，这些函数监测mysqld的健康状况。如果它们发现一些 "意外 "的东西，就会有一个条目写到stderr，mysqld\_safe将其引向错误日志！这也意味着，如果你遇到了 "意外"，就会有一个条目写到stderr。这也意味着，如果你在使用MySQL时遇到一些意想不到的问题，并且正在使用一个源码发行版，你应该做的第一件事就是配置MySQL以进行调试。如果你认为你已经发现了一个错误，请使用第1.6节 "如何报告错误或问题 "中的说明。

在Windows的MySQL发行版中，mysqld.exe被默认编译为支持跟踪文件。

5.9.1.2 Creating Trace Files

如果mysqld服务器不启动或容易崩溃，你可以尝试创建一个跟踪文件来找到问题。

要做到这一点，你必须有一个已经被编译为支持调试的mysqld。你可以通过执行 mysqld -V 来检查这一点。如果版本号以-debug结尾，它被编译为支持跟踪文件。(在Windows上，调试服务器被命名为mysqld-debug而不是mysqld)。

启动mysqld服务器，在Unix上的/tmp/mysqld.trace或Windows上的\mysqld.trace中有一个跟踪日志。

shell> **mysqld --debug**

On Windows, you should also use the [--standalone](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_standalone) flag to not start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** as a service. In a console window, use this command:

C:\> **mysqld-debug --debug --standalone**

After this, you can use the **mysql.exe** command-line tool in a second console window to reproduce the problem. You can stop the **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** server with **[mysqladmin shutdown](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqladmin" \o "4.5.2 mysqladmin — A MySQL Server Administration Program)**.

The trace file can become ***very large***! To generate a smaller trace file, you can use debugging options something like this:

[**mysqld --debug=d,info,error,query,general,where:O,/tmp/mysqld.trace**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysqld)

This only prints information with the most interesting tags to the trace file.

If you file a bug, please add only those lines from the trace file to the bug report that indicate where something seems to go wrong. If you cannot locate the wrong place, open a bug report and upload the whole trace file to the report, so that a MySQL developer can take a look at it. For instructions, see [Section 1.6, “How to Report Bugs or Problems”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\introduction.html#bug-reports).

The trace file is made with the ***DBUG*** package by Fred Fish. See [Section 5.9.4, “The DBUG Package”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#dbug-package).

#### 5.9.1.3 Using WER with PDB to create a Windows crashdump

程序数据库文件（后缀为pdb）包括在MySQL的ZIP档案调试二进制文件和测试套件分发中。这些文件为在出现问题时调试你的MySQL安装提供信息。这是一个独立于标准MSI或Zip文件的下载。

注意

PDB文件可在一个单独的文件中获得，该文件标记为 "ZIP Archive Debug Binaries & Test Suite"。

PDB文件包含关于mysqld和其他工具的更详细的信息，可以创建更详细的跟踪和转储文件。你可以用WinDbg或Visual Studio使用这些来调试mysqld。

关于PDB文件的更多信息，见微软知识库文章121366。关于可用的调试选项的更多信息，参见Windows的调试工具。

要使用WinDbg，可以安装完整的Windows驱动套件（WDK）或安装独立的版本。

重要提示

.exe和.pdb文件必须完全匹配（包括版本号和MySQL服务器版本）；否则，WinDBG在尝试加载符号时就会抱怨。

1. 要生成minidump mysqld.dmp，在my.ini的[mysqld]部分启用core-file选项。在进行这些修改后，重新启动MySQL服务器。

2. 创建一个目录来存储生成的文件，例如c:\symbols

3. 使用查找图形用户界面或从命令行确定windbg.exe可执行文件的路径，例如：dir /s /b windbg.exe -- 一个常见的默认值是C:\Program Files\Debugging Tools for Windows (x64)\windbg.exe

4. 启动windbg.exe，给它提供mysqld.exe、mysqld.pdb、mysqld.dmp和源代码的路径。或者，从WinDbg GUI中传入每个路径。比如说。

windbg.exe -i "C:\mysql-8.0.25-winx64\bin\"^

1. -z "C:\mysql-8.0.25-winx64\data\mysqld.dmp"^
2. -srcpath "E:\ade\mysql\_archives\8.0\8.0.25\mysql-8.0.25"^
3. -y "C:\mysql-8.0.25-winx64\bin;SRV\*c:\symbols\*http://msdl.microsoft.com/download/symbols"^
4. -v -n -c "!analyze -vvvvv"

**Note**

The **^** character and newline are removed by the Windows command line processor, so be sure the spaces remain intact.

#### 5.9.1.4 Debugging mysqld under gdb

On most systems you can also start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** from **gdb** to get more information if **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** crashes.

With some older **gdb** versions on Linux you must use **run --one-thread** if you want to be able to debug **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** threads. In this case, you can only have one thread active at a time.

NPTL threads (the new thread library on Linux) may cause problems while running **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** under **gdb**. Some symptoms are:

* [**mysqld**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysqld) hangs during startup (before it writes **ready for connections**).
* [**mysqld**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysqld) crashes during a **pthread\_mutex\_lock()** or **pthread\_mutex\_unlock()** call.

In this case, you should set the following environment variable in the shell before starting **gdb**:

LD\_ASSUME\_KERNEL=2.4.1

export LD\_ASSUME\_KERNEL

When running **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** under **gdb**, you should disable the stack trace with [--skip-stack-trace](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_skip-stack-trace) to be able to catch segfaults within **gdb**.

Use the [--gdb](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_gdb) option to **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** to install an interrupt handler for **SIGINT** (needed to stop **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with **^C** to set breakpoints) and disable stack tracing and core file handling.

It is very hard to debug MySQL under **gdb** if you do a lot of new connections the whole time as **gdb** does not free the memory for old threads. You can avoid this problem by starting **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with **[thread\_cache\_size](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_thread_cache_size)** set to a value equal to **[max\_connections](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_max_connections)** + 1. In most cases just using [--thread\_cache\_size=5'](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_thread_cache_size) helps a lot!

If you want to get a core dump on Linux if [**mysqld**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\programs.html#mysqld) dies with a SIGSEGV signal, you can start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with the [--core-file](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#option_mysqld_core-file) option. This core file can be used to make a backtrace that may help you find out why **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** died:

shell> **gdb mysqld core**

gdb> backtrace full

gdb> quit

See [Section B.3.3.3, “What to Do If MySQL Keeps Crashing”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\error-handling.html#crashing).

If you are using **gdb** on Linux, you should install a .gdb file, with the following information, in your current directory:

set print sevenbit off

handle SIGUSR1 nostop noprint

handle SIGUSR2 nostop noprint

handle SIGWAITING nostop noprint

handle SIGLWP nostop noprint

handle SIGPIPE nostop

handle SIGALRM nostop

handle SIGHUP nostop

handle SIGTERM nostop noprint

Here is an example how to debug **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**:

shell> **gdb /usr/local/libexec/mysqld**

gdb> run

...

backtrace full # Do this when mysqld crashes

Include the preceding output in a bug report, which you can file using the instructions in [Section 1.6, “How to Report Bugs or Problems”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\introduction.html#bug-reports).

If **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** hangs, you can try to use some system tools like **strace** or **/usr/proc/bin/pstack** to examine where **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** has hung.

strace /tmp/log libexec/mysqld

If you are using the Perl **DBI** interface, you can turn on debugging information by using the **trace** method or by setting the **DBI\_TRACE** environment variable.

#### 5.9.1.5 Using a Stack Trace

On some operating systems, the error log contains a stack trace if **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** dies unexpectedly. You can use this to find out where (and maybe why) **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** died. See [Section 5.4.2, “The Error Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#error-log). To get a stack trace, you must not compile **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with the -fomit-frame-pointer option to gcc. See [Section 5.9.1.1, “Compiling MySQL for Debugging”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#compiling-for-debugging).

A stack trace in the error log looks something like this:

mysqld got signal 11;

Attempting backtrace. You can use the following information

to find out where mysqld died. If you see no messages after

this, something went terribly wrong...

stack\_bottom = 0x41fd0110 thread\_stack 0x40000

mysqld(my\_print\_stacktrace+0x32)[0x9da402]

mysqld(handle\_segfault+0x28a)[0x6648e9]

/lib/libpthread.so.0[0x7f1a5af000f0]

/lib/libc.so.6(strcmp+0x2)[0x7f1a5a10f0f2]

mysqld(\_Z21check\_change\_passwordP3THDPKcS2\_Pcj+0x7c)[0x7412cb]

mysqld(\_ZN16set\_var\_password5checkEP3THD+0xd0)[0x688354]

mysqld(\_Z17sql\_set\_variablesP3THDP4ListI12set\_var\_baseE+0x68)[0x688494]

mysqld(\_Z21mysql\_execute\_commandP3THD+0x41a0)[0x67a170]

mysqld(\_Z11mysql\_parseP3THDPKcjPS2\_+0x282)[0x67f0ad]

mysqld(\_Z16dispatch\_command19enum\_server\_commandP3THDPcj+0xbb7[0x67fdf8]

mysqld(\_Z10do\_commandP3THD+0x24d)[0x6811b6]

mysqld(handle\_one\_connection+0x11c)[0x66e05e]

If resolution of function names for the trace fails, the trace contains less information:

mysqld got signal 11;

Attempting backtrace. You can use the following information

to find out where mysqld died. If you see no messages after

this, something went terribly wrong...

stack\_bottom = 0x41fd0110 thread\_stack 0x40000

[0x9da402]

[0x6648e9]

[0x7f1a5af000f0]

[0x7f1a5a10f0f2]

[0x7412cb]

[0x688354]

[0x688494]

[0x67a170]

[0x67f0ad]

[0x67fdf8]

[0x6811b6]

[0x66e05e]

Newer versions of **glibc** stack trace functions also print the address as relative to the object. On **glibc**-based systems (Linux), the trace for an unexpected exit within a plugin looks something like:

plugin/auth/auth\_test\_plugin.so(+0x9a6)[0x7ff4d11c29a6]

To translate the relative address (**+0x9a6**) into a file name and line number, use this command:

shell> **addr2line -fie auth\_test\_plugin.so 0x9a6**

auth\_test\_plugin

mysql-trunk/plugin/auth/test\_plugin.c:65

The **addr2line** utility is part of the **binutils** package on Linux.

On Solaris, the procedure is similar. The Solaris **printstack()** already prints relative addresses:

plugin/auth/auth\_test\_plugin.so:0x1510

To translate, use this command:

shell> **gaddr2line -fie auth\_test\_plugin.so 0x1510**

mysql-trunk/plugin/auth/test\_plugin.c:88

Windows already prints the address, function name and line:

000007FEF07E10A4 auth\_test\_plugin.dll!auth\_test\_plugin()[test\_plugin.c:72]

#### 5.9.1.6 Using Server Logs to Find Causes of Errors in mysqld

Note that before starting **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with the general query log enabled, you should check all your tables with **[myisamchk](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "myisamchk" \o "4.6.4 myisamchk — MyISAM Table-Maintenance Utility)**. See [Chapter 5, *MySQL Server Administration*](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html).

If **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** dies or hangs, you should start **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with the general query log enabled. See [Section 5.4.3, “The General Query Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#query-log). When **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** dies again, you can examine the end of the log file for the query that killed **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**.

If you use the default general query log file, the log is stored in the database directory as ***host\_name***.log In most cases it is the last query in the log file that killed **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**, but if possible you should verify this by restarting **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** and executing the found query from the **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** command-line tools. If this works, you should also test all complicated queries that did not complete.

You can also try the command [**EXPLAIN**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#explain) on all [**SELECT**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#select) statements that takes a long time to ensure that **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** is using indexes properly. See [Section 13.8.2, “EXPLAIN Statement”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\sql-statements.html#explain).

You can find the queries that take a long time to execute by starting **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with the slow query log enabled. See [Section 5.4.5, “The Slow Query Log”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#slow-query-log).

If you find the text **mysqld restarted** in the error log (normally a file named ***host\_name***.err) you probably have found a query that causes **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** to fail. If this happens, you should check all your tables with **[myisamchk](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "myisamchk" \o "4.6.4 myisamchk — MyISAM Table-Maintenance Utility)** (see [Chapter 5, *MySQL Server Administration*](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html)), and test the queries in the MySQL log files to see whether one fails. If you find such a query, try first upgrading to the newest MySQL version. If this does not help, report a bug, see [Section 1.6, “How to Report Bugs or Problems”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\introduction.html#bug-reports).

If you have started **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** with the **[myisam\_recover\_options](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_myisam_recover_options)** system variable set, MySQL automatically checks and tries to repair **MyISAM** tables if they are marked as 'not closed properly' or 'crashed'. If this happens, MySQL writes an entry in the **hostname.err** file **'Warning: Checking table ...'** which is followed by **Warning: Repairing table** if the table needs to be repaired. If you get a lot of these errors, without **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** having died unexpectedly just before, then something is wrong and needs to be investigated further. See [Section 5.1.7, “Server Command Options”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#server-options).

When the server detects **MyISAM** table corruption, it writes additional information to the error log, such as the name and line number of the source file, and the list of threads accessing the table. Example: **Got an error from thread\_id=1, mi\_dynrec.c:368**. This is useful information to include in bug reports.

It is not a good sign if **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** did die unexpectedly, but in this case, you should not investigate the **Checking table...** messages, but instead try to find out why **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)** died.

#### 5.9.1.7 Making a Test Case If You Experience Table Corruption

下面的过程适用于MyISAM表。关于遇到InnoDB表损坏时应采取的步骤，请参阅第1.6节，"如何报告错误或问题"。

如果你遇到MyISAM表损坏，或者如果mysqld在一些更新语句后总是失败，你可以通过做以下事情来测试这个问题是否可以重复。

1. 用 mysqladmin shutdown 停止 MySQL 守护进程。

2. 2.做一个表的备份，以防止非常不可能发生的情况，即修复时做了一些坏事。

3. 3. 用myisamchk -s database/\*.MYI检查所有表。用 myisamchk -r database/table.MYI 来修复任何损坏的表。

4. 4. 对这些表进行第二次备份。

5. 如果你需要更多的空间，从MySQL数据目录中删除（或移开）任何旧的日志文件。

6. 在启用二进制日志的情况下启动mysqld。如果你想找到一个使mysqld崩溃的语句，你应该在启动服务器时也启用一般的查询日志。参见第5.4.3节，"一般查询日志 "和第5.4.4节，"二进制日志"。

7. 7. 当你得到一个崩溃的表时，停止mysqld服务器。

8. 8.恢复备份。

9. 在没有启用二进制日志的情况下重新启动mysqld服务器。

10. 重新执行带有mysqlbinlog binary-log-file | mysql的语句。二进制日志保存在MySQL数据库目录中，名称为hostname-bin.NNNNN。

11. 如果表再次被破坏，或者你可以用上述命令让mysqld死掉，你已经发现了一个可重复的错误。使用第1.6节 "如何报告错误或问题 "中的说明，将表和二进制日志FTP到我们的错误数据库。如果你是一个支持客户，你可以使用MySQL客户支持中心（https://www.mysql.com/support/）来提醒MySQL团队注意这个问题，并尽快将其修复。5.9.2 调试 MySQL 客户端

To be able to debug a MySQL client with the integrated debug package, you should configure MySQL with [-DWITH\_DEBUG=1](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#option_cmake_with_debug). See [Section 2.9.7, “MySQL Source-Configuration Options”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\installing.html#source-configuration-options).

Before running a client, you should set the **MYSQL\_DEBUG** environment variable:

shell> **MYSQL\_DEBUG=d:t:O,/tmp/client.trace**

shell> **export MYSQL\_DEBUG**

This causes clients to generate a trace file in /tmp/client.trace.

If you have problems with your own client code, you should attempt to connect to the server and run your query using a client that is known to work. Do this by running **[mysql](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysql" \o "4.5.1 mysql — The MySQL Command-Line Client)** in debugging mode (assuming that you have compiled MySQL with debugging on):

shell> **mysql --debug=d:t:O,/tmp/client.trace**

This provides useful information in case you mail a bug report. See [Section 1.6, “How to Report Bugs or Problems”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\introduction.html#bug-reports).

If your client crashes at some 'legal' looking code, you should check that your mysql.h include file matches your MySQL library file. A very common mistake is to use an old mysql.h file from an old MySQL installation with new MySQL library.

### 5.9.3  LOCK\_ORDER 工具

MySQL服务器是一个多线程应用程序，它使用许多内部锁和与锁相关的基元，如mutexes、rwlocks（包括prlocks和sxlocks）、条件和文件。在服务器内部，与锁相关的对象集随着新功能的实现和为提高性能而进行的代码重构而变化。与任何使用锁基元的多线程应用程序一样，当多个锁同时被持有时，在执行过程中总是有遇到死锁的风险。对于MySQL来说，死锁的影响是灾难性的，会导致服务完全丧失。

从MySQL 8.0.17开始，为了能够检测到锁获取的死锁，并执行运行时没有死锁，MySQL支持LOCK\_ORDER工具。这使得锁顺序依赖图被定义为服务器设计的一部分，服务器运行时检查以确保锁获取是无环的，并且执行路径符合该图。

本节提供了关于使用LOCK\_ORDER工具的信息，但只是一个基本水平。有关完整的细节，请参见MySQL Server Doxygen文档中的锁顺序部分，可在https://dev.mysql.com/doc/index-other.html。

LOCK\_ORDER工具是用于调试服务器的，不用于生产。

要使用LOCK\_ORDER工具，请遵循以下程序。

1. 从源码构建MySQL，用-DWITH\_LOCK\_ORDER=ON CMake选项进行配置，以便构建时包括LOCK\_ORDER工具。

注意

在启用WITH\_LOCK\_ORDER选项时，MySQL的构建需要flex程序。

2. 要在启用LOCK\_ORDER工具的情况下运行服务器，在服务器启动时启用lock\_order系统变量。其他几个系统变量也可用于LOCK\_ORDER配置。

3. 对于MySQL测试套件的操作，mysql-test-run.pl有一个--lock-order选项，控制是否在测试案例执行期间启用LOCK\_ORDER工具。

下面描述的系统变量配置了LOCK\_ORDER工具的操作，假设MySQL已经被构建为包括LOCK\_ORDER工具。主要变量是lock\_order，它指示是否在运行时启用LOCK\_ORDER工具。

- 如果lock\_order被禁用（默认），其他LOCK\_ORDER系统变量没有任何影响。

- 如果lock\_order被启用，其他系统变量将配置启用哪些LOCK\_ORDER功能。

注意

一般来说，打算通过执行带有--lock-order选项的mysql-test-run.pl来配置LOCK\_ORDER工具，并且让mysql-test-run.pl将LOCK\_ORDER系统变量设置为适当的值。

所有LOCK\_ORDER系统变量必须在服务器启动时设置。在运行时，它们的值是可见的，但不能被改变。

一些系统变量成对存在，例如lock\_order\_debug\_loop和lock\_order\_trace\_loop。对于这样的对，当与之相关的条件发生时，变量的区别如下。

- 如果\_debug\_变量被启用，就会提出一个调试断言。

- 如果\_trace\_变量被启用，一个错误将被打印到日志中。

**Table 5.7 LOCK\_ORDER System Variable Summary**

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Type** | **Variable Scope** |
| [**lock\_order**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order) | Boolean | Global |
| [**lock\_order\_debug\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_loop) | Boolean | Global |
| [**lock\_order\_debug\_missing\_arc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_arc) | Boolean | Global |
| [**lock\_order\_debug\_missing\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_key) | Boolean | Global |
| [**lock\_order\_debug\_missing\_unlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_unlock) | Boolean | Global |
| [**lock\_order\_dependencies**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_dependencies) | File name | Global |
| [**lock\_order\_extra\_dependencies**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_extra_dependencies) | File name | Global |
| [**lock\_order\_output\_directory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_output_directory) | Directory name | Global |
| [**lock\_order\_print\_txt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_print_txt) | Boolean | Global |
| [**lock\_order\_trace\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_loop) | Boolean | Global |
| [**lock\_order\_trace\_missing\_arc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_arc) | Boolean | Global |
| [**lock\_order\_trace\_missing\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_key) | Boolean | Global |
| [**lock\_order\_trace\_missing\_unlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_unlock) | Boolean | Global |

* **[lock\_order](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

- 是否在运行时启用LOCK\_ORDER工具。如果lock\_order被禁用（默认），其他LOCK\_ORDER系统变量没有任何影响。如果lock\_order被启用，其他系统变量将配置启用哪些LOCK\_ORDER功能。

* - 如果lock\_order被启用，如果服务器遇到一个没有在lock-order图中声明的lock-acquisition序列，将产生一个错误。
* [**lock\_order\_debug\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_loop)

|  |  |
| --- | --- |
| Command-Line Format | --lock-order-debug-loop[={OFF|ON}] |
| Introduced | 8.0.17 |
| System Variable | [**lock\_order\_debug\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_loop) |
| Scope | Global |
| Dynamic | No |
| [SET\_VAR](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var) Hint Applies | No |
| Type | Boolean |
| Default Value | **OFF** |

* Whether the LOCK\_ORDER tool causes a debug assertion failure when it encounters a dependency that is flagged as a loop in the lock-order graph.

* **[lock\_order\_debug\_missing\_arc](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_debug_missing_arc)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-debug-missing-arc[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_debug\_missing\_arc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_arc) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the LOCK\_ORDER tool causes a debug assertion failure when it encounters a dependency that is not declared in the lock-order graph.

* **[lock\_order\_debug\_missing\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_debug_missing_key)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-debug-missing-key[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_debug\_missing\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_key) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the LOCK\_ORDER tool causes a debug assertion failure when it encounters an object that is not properly instrumented with the Performance Schema.

* **[lock\_order\_debug\_missing\_unlock](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_debug_missing_unlock)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-debug-missing-unlock[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_debug\_missing\_unlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_debug_missing_unlock) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the LOCK\_ORDER tool causes a debug assertion failure when it encounters a lock that is destroyed while still held.

* **[lock\_order\_dependencies](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_dependencies)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-dependencies=file\_name** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_dependencies**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_dependencies) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **empty string** |

* The path to the lock\_order\_dependencies.txt file that defines the server lock-order dependency graph.
* It is permitted to specify no dependencies. An empty dependency graph is used in this case.

* **[lock\_order\_extra\_dependencies](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_extra_dependencies)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-extra-dependencies=file\_name** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_extra\_dependencies**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_extra_dependencies) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | File name |
| **Default Value** | **empty string** |

- 文件的路径，该文件包含锁序依赖关系图的附加依赖关系。这对修改主服务器的依赖关系图（定义在 lock\_order\_dependencies.txt 文件中）很有用，该文件包含描述第三方代码行为的额外依赖关系。(另一种方法是修改lock\_order\_dependencies.txt文件本身，但我们不鼓励这样做）。

- 如果没有设置这个变量，就不会使用二级文件。

* [**lock\_order\_output\_directory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_output_directory)

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-output-directory=dir\_name** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_output\_directory**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_output_directory) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Directory name |
| **Default Value** | **empty string** |

* The directory where the LOCK\_ORDER tool writes its logs. If this variable is not set, the default is the current directory.

* **[lock\_order\_print\_txt](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_print_txt)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-print-txt[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_print\_txt**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_print_txt) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the LOCK\_ORDER tool performs a lock-order graph analysis and prints a textual report. The report includes any lock-acquisition cycles detected.

* **[lock\_order\_trace\_loop](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_trace_loop)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-trace-loop[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_trace\_loop**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_loop) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the LOCK\_ORDER tool prints a trace in the log file when it encounters a dependency that is flagged as a loop in the lock-order graph.

* **[lock\_order\_trace\_missing\_arc](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_trace_missing_arc)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-trace-missing-arc[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_trace\_missing\_arc**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_arc) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* Whether the LOCK\_ORDER tool prints a trace in the log file when it encounters a dependency that is not declared in the lock-order graph.

* **[lock\_order\_trace\_missing\_key](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_trace_missing_key)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-trace-missing-key[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_trace\_missing\_key**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_key) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **OFF** |

* Whether the LOCK\_ORDER tool prints a trace in the log file when it encounters an object that is not properly instrumented with the Performance Schema.

* **[lock\_order\_trace\_missing\_unlock](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\server-administration.html" \l "sysvar_lock_order_trace_missing_unlock)**

|  |  |
| --- | --- |
| **Command-Line Format** | **--lock-order-trace-missing-unlock[={OFF|ON}]** |
| **Introduced** | 8.0.17 |
| **System Variable** | [**lock\_order\_trace\_missing\_unlock**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_lock_order_trace_missing_unlock) |
| **Scope** | Global |
| **Dynamic** | No |
| [**SET\_VAR**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\optimization.html#optimizer-hints-set-var)**Hint Applies** | No |
| **Type** | Boolean |
| **Default Value** | **ON** |

* Whether the LOCK\_ORDER tool prints a trace in the log file when it encounters a lock that is destroyed while still held.

### 5.9.4 DBUG 包

MySQL服务器和大多数MySQL客户端是用最初由Fred Fish创建的DBUG包编译的。当你把MySQL配置为调试时，这个包使你有可能得到程序正在做的跟踪文件。见第5.9.1.2节，"创建跟踪文件"。

本节总结了你可以在命令行的调试选项中为已建立了调试支持的MySQL程序指定的参数值。

DBUG包可以通过调用带有-debug[=debug\_options]或-# [debug\_options]选项的程序来使用。如果你指定了--debug或-#选项而没有debug\_options值，大多数MySQL程序会使用一个默认值。服务器默认值在Unix上是d:t:i:o,/tmp/mysqld.trace，在Windows上是d:t:i:O,`mysqld.trace。这个默认值的效果是。

- d: 启用所有调试宏的输出

- t: 追踪函数调用和退出

- i: 在输出行添加PID

- o,/tmp/mysqld.trace, O,\mysqld.trace。设置调试输出文件。

大多数客户程序使用默认的debug\_options值为d:t:o,/tmp/program\_name.trace，与平台无关。

下面是一些调试控制字符串的例子，它们可能在shell命令行中被指定。

--debug=d:t

--debug=d:f,main,subr1:F:L:t,20

--debug=d,input,output,files:n

--debug=d:t:i:O,\\mysqld.trace

For **[mysqld](file:///C:\\Users\\Administrator\\Downloads\\refman-8.0-en.html-chapter\\refman-8.0-en.html-chapter\\programs.html" \l "mysqld" \o "4.3.1 mysqld — The MySQL Server)**, it is also possible to change DBUG settings at runtime by setting the [**debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug) system variable. This variable has global and session values:

mysql> **SET GLOBAL debug = '*debug\_options*';**

mysql> **SET SESSION debug = '*debug\_options*';**

Changing the global [**debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug) value requires privileges sufficient to set global system variables. Changing the session [**debug**](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#sysvar_debug) value requires privileges sufficient to set restricted session system variables. See [Section 5.1.9.1, “System Variable Privileges”](file:///C:\Users\Administrator\Downloads\refman-8.0-en.html-chapter\refman-8.0-en.html-chapter\server-administration.html#system-variable-privileges).

The ***debug\_options*** value is a sequence of colon-separated fields:

field\_1:field\_2:...:field\_***N***

Each field within the value consists of a mandatory flag character, optionally preceded by a **+** or **-** character, and optionally followed by a comma-separated list of modifiers:

[+|-]flag[,modifier,modifier,...,modifier]

The following table describes the permitted flag characters. Unrecognized flag characters are silently ignored.

| **Flag** | **Description** |
| --- | --- |
| **d** | Enable output from DBUG\_***XXX*** macros for the current state. May be followed by a list of keywords, which enables output only for the DBUG macros with that keyword. An empty list of keywords enables output for all macros.  In MySQL, common debug macro keywords to enable are **enter**, **exit**, **error**, **warning**, **info**, and **loop**. |
| **D** | Delay after each debugger output line. The argument is the delay, in tenths of seconds, subject to machine capabilities. For example, **D,20** specifies a delay of two seconds. |
| **f** | Limit debugging, tracing, and profiling to the list of named functions. An empty list enables all functions. The appropriate **d** or **t** flags must still be given; this flag only limits their actions if they are enabled. |
| **F** | Identify the source file name for each line of debug or trace output. |
| **i** | Identify the process with the PID or thread ID for each line of debug or trace output. |
| **L** | Identify the source file line number for each line of debug or trace output. |
| **n** | Print the current function nesting depth for each line of debug or trace output. |
| **N** | Number each line of debug output. |
| **o** | Redirect the debugger output stream to the specified file. The default output is **stderr**. |
| **O** | Like **o**, but the file is really flushed between each write. When needed, the file is closed and reopened between each write. |
| **p** | Limit debugger actions to specified processes. A process must be identified with the **DBUG\_PROCESS** macro and match one in the list for debugger actions to occur. |
| **P** | Print the current process name for each line of debug or trace output. |
| **r** | When pushing a new state, do not inherit the previous state's function nesting level. Useful when the output is to start at the left margin. |
| **S** | Do function **\_sanity(\_file\_,\_line\_)** at each debugged function until **\_sanity()** returns something that differs from 0. |
| **t** | Enable function call/exit trace lines. May be followed by a list (containing only one modifier) giving a numeric maximum trace level, beyond which no output occurs for either debugging or tracing macros. The default is a compile time option. |

前导的 "+"或"-"字符和后面的修改器列表用于标志字符，如d或f，可以对所有适用的修改器或只是其中的一些修改器启用调试操作。

- 如果没有前面的 "+"或"-"，标志值就会被设置为所给的修改器列表。

- 如果有前导的 "+"或"-"，则列表中的修改器被添加到当前的修改器列表中或从其中减去。

下面的例子显示了这对d标志的作用。一个空的d列表使所有调试宏的输出成为可能。一个非空的列表只启用列表中的宏关键词的输出。

这些语句将d值设置为给定的修改器列表。

mysql> **SET debug = 'd';**

mysql> **SELECT @@debug;**

+---------+

| @@debug |

+---------+

| d |

+---------+

mysql> **SET debug = 'd,error,warning';**

mysql> **SELECT @@debug;**

+-----------------+

| @@debug |

+-----------------+

| d,error,warning |

+-----------------+

A leading **+** or **-** adds to or subtracts from the current **d** value:

mysql> **SET debug = '+d,loop';**

mysql> **SELECT @@debug;**

+----------------------+

| @@debug |

+----------------------+

| d,error,warning,loop |

+----------------------+

mysql> **SET debug = '-d,error,loop';**

mysql> **SELECT @@debug;**

+-----------+

| @@debug |

+-----------+

| d,warning |

+-----------+

Adding to “all macros enabled” results in no change:

mysql> **SET debug = 'd';**

mysql> **SELECT @@debug;**

+---------+

| @@debug |

+---------+

| d |

+---------+

mysql> **SET debug = '+d,loop';**

mysql> **SELECT @@debug;**

+---------+

| @@debug |

+---------+

| d |

+---------+

Disabling all enabled macros disables the **d** flag entirely:

mysql> SET debug = 'd,error,loop';

mysql> SELECT @@debug;

+--------------+

| @@debug |

+--------------+

| d,error,loop |

+--------------+

mysql> SET debug = '-d,error,loop';

mysql> SELECT @@debug;

+---------+

| @@debug |

+---------+

| |

+---------+