



# PERCONA

## Percona Distribution for MySQL

### Documentation

8.0.42 (May 21, 2025)

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# Percona Distribution for MySQL 8.0 Documentation

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together. With [Percona Server for MySQL](#) or [Percona XtraDB Cluster](#) as the base server, the distribution brings you the enterprise-grade [features](#) for free. The set of carefully selected [components](#) helps you operate your MySQL database to meet your application and business needs.

## Features

- **Increased stability and availability** - The set of high-availability and backup options help you ensure your data is saved and available for your business applications.
- **Improved performance and efficiency** - Integrated tools help DBAs maintain, manage and monitor the database performance and timely respond to changing demands.
- **Reduced costs** - Save on purchasing software licensing by using the distribution - the open-source enterprise-grade solution.
- **Easy-to-integrate with PMM** - Benefit from all the features of [PMM](#) for monitoring and managing the health of your database.

Percona Distribution for MySQL comes in two [deployment variants](#): one is based on *Percona Server for MySQL* and another one - on *Percona XtraDB Cluster*. They differ in the set of components and how you can use them.

## Get started

Follow the [installation instructions](#) to get started with Percona Distribution for MySQL.

Read more about solutions you can deploy with Percona Distribution for MySQL in [solutions](#).

Learn more about what's new in Percona Distribution for MySQL in the [release notes](#).

## Read more

- [Deployment variants](#)
- [Percona Distribution for MySQL components](#)

# Get help from Percona

Our documentation guides are packed with information, but they can't cover everything you need to know about Percona Distribution for MySQL. They also won't cover every scenario you might come across. Don't be afraid to try things out and ask questions when you get stuck.

## Percona's Community Forum

Be a part of a space where you can tap into a wealth of knowledge from other database enthusiasts and experts who work with Percona's software every day. While our service is entirely free, keep in mind that response times can vary depending on the complexity of the question. You are engaging with people who genuinely love solving database challenges.

We recommend visiting our [Community Forum](#). It's an excellent place for discussions, technical insights, and support around Percona database software. If you're new and feeling a bit unsure, our [FAQ](#) and [Guide for New Users](#) ease you in.

If you have thoughts, feedback, or ideas, the community team would like to hear from you at [Any ideas on how to make the forum better?](#). We're always excited to connect and improve everyone's experience.

## Percona experts

Percona experts bring years of experience in tackling tough database performance issues and design challenges.

**Talk to a Percona Expert**

We understand your challenges when managing complex database environments. That's why we offer various services to help you simplify your operations and achieve your goals.

Service	Description
24/7 Expert Support	Our dedicated team of database experts is available 24/7 to assist you with any database issues. We provide flexible support plans tailored to your specific needs.
Hands-On Database Management	Our managed services team can take over the day-to-day management of your database infrastructure, freeing up your time to focus on other priorities.

Service	Description
Expert Consulting	Our experienced consultants provide guidance on database topics like architecture design, migration planning, performance optimization, and security best practices.
Comprehensive Training	Our training programs help your team develop skills to manage databases effectively, offering virtual and in-person courses.

We're here to help you every step of the way. Whether you need a quick fix or a long-term partnership, we're ready to provide your expertise and support.



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# **Percona Distribution for MySQL using Percona Server for MySQL**

# Percona Distribution for MySQL 8.0.42 using Percona Server for MySQL (2025-05-21)

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is based on [Percona Server for MySQL 8.0.42-33](#) that includes all the features and bug fixes available in the [MySQL 8.0.42 Community Edition](#) and enterprise-grade features developed by Percona.

## Release highlights

### Percona Server for MySQL 8.0.42-33

- Improves the `audit_log_filter_set_user()` UDF to accept account names with wildcard characters ( `'%'` and `'_'` ) in the host part. For example, you can use `'usr1@%'`, `'usr2%192.168.0.%'`, or `'usr3@%.mycorp.com'`.
- Updates the C++ level of the KMPI library to enhance error handling capabilities.
- Improves optimizer behavior by restoring correct handling of const tables in `test_quick_select()`. A MySQL Upstream refactor (commit [9a13c1c](#)) removed the `QEP_TAB` dependency, causing `get_quick_record_count()` to no longer pass const table information. This could lead to suboptimal range scan boundaries. The applied patch resolves the issue by explicitly passing `const_tables` to `test_quick_select()`, ensuring consistent behavior with the pre-refactor logic.

The latest MyRocks storage engine incorporates code based on RocksDB version 9.3.1. Percona has applied minor modifications to the original RocksDB codebase. Check the list of modifications at <https://github.com/percona/rocksdb/>.

This release adds the following changes to the list of [MyRocks variables](#).

#### Adds new MyRocks variables

- [--rocksdb\\_bulk\\_load\\_compression\\_parallel\\_threads](#)
- [--rocksdb\\_bulk\\_load\\_enable\\_unique\\_key\\_check](#)
- [--rocksdb\\_debug\\_skip\\_bloom\\_filter\\_check\\_on\\_iterator\\_bounds](#)
- [--rocksdb\\_enable\\_udt\\_in\\_mem](#)
- [--rocksdb\\_invalid\\_create\\_option\\_action](#)

- [`--rocksdb\_io\_error\_action`](#)
- [`--rocksdb\_table\_stats\_skip\_system\_cf`](#)
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- [`--rocksdb\_enable\_instant\_ddl`](#)
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- [`--rocksdb-debug-skip-bloom-filter-check-on-iterator-bounds`](#)

### Changes default values of MyRocks variables

- [`--rocksdb\_disable\_instant\_ddl`](#) - the default value is changed from `ON` to `OFF`.
- [`--rocksdb\_file\_checksums`](#) - the data type is changed from `Boolean` to `ENUM`. Also, the default value is changed from `OFF` to `CHECKSUMS_OFF`.
- [`--rocksdb\_compaction\_readahead\_size`](#) - the default value is changed from `0` (zero) to `2097152`.

### Deprecates MyRocks variable

- [`--rocksdb\_disable\_instant\_ddl`](#) - this variable is being deprecated and is expected to be removed in a future release.

### Removes MyRocks variables

- [`--rocksdb-access-hint-on-compaction-start`](#)
- [`--rocksdb\_large\_prefix`](#)
- [`--rocksdb\_strict\_collation\_check`](#)
- [`--rocksdb\_strict\_collation\_exceptions`](#)

## MySQL 8.0.42

Improvements and bug fixes provided by Oracle for MySQL 8.0.42 and included in Percona Server for MySQL are the following:

- Fixed an issue where `CHECK TABLE` sometimes incorrectly reported that spatial indexes were corrupted. (Bug #37286473)
- Fixed an issue in InnoDB redo log recovery to improve data safety after a crash. (Bug #37061960)
- Fixed an issue where reading `index_id` values could lead to incorrect behavior with indexes. (Bug #36993445, Bug #37709706)
- Fixed a bug related to the `lower_case_table_names` setting that caused inconsistent behavior with table names on different systems. (Bug #32288105)
- Fixed a bug where `mysqldump` did not properly escape certain special characters in its output. (Bug #37540722, Bug #37709163)
- The `fprintf_string()` function in `mysqldump` did not use the correct quote character for escaping strings. (Bug #37607195)

Find the complete list of bug fixes and changes in the [MySQL 8.0.42 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-17</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.7.3</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.35-33</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.7.0-2</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.42</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.42</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers



# Percona Distribution for MySQL 8.0.41 using Percona Server for MySQL (2025-02-26)

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is based on [Percona Server for MySQL 8.0.41-32](#) that includes all the features and bug fixes available in the [MySQL 8.0.41 Community Edition](#) and enterprise-grade features developed by Percona.

## Release highlights

### Percona Server for MySQL 8.0.41-32

- Extends the [Encryption user-defined functions](#) with the following:
  - Added support for `pkcs1`, `oaep`, or `no` padding for RSA encrypt and decrypt operations
  - Added support for `pkcs1` or `pkcs1_pss` padding for RSA sign and verify operations
  - Added the `encryption_udf.legacy_padding_scheme` system variable to manage legacy padding schemes
  - Added the character set awareness
- Improves the [Data masking](#) performance by introducing an internal term cache. The new cache speeds up lookups for `gen_blocklist()` and `gen_dictionary()` functions by storing dictionary data in memory.

Find more detailed information in the [Data masking overview](#) and in the [Data masking component functions](#).

### MySQL 8.0.41

Improvements and bug fixes provided by Oracle for MySQL 8.0.41 and included in Percona Server for MySQL are the following:

- Fixed an assertion in debug builds where certain IO buffer serializations caused system hangs. (Bug #37139618)
- Resolved a failure when dropping the primary key and adding a new `AUTO_INCREMENT` column as the primary key in descending order using the `INPLACE` algorithm resulted in failure. (Bug #36658450)

- Fixed incorrect results, including missing rows, in queries that used a descending primary key with the `index_merge` optimization. (Bug #106207, Bug #33767814)
- Addressed a replication channel issue where MySQL failed to stop the channel properly when large transactions were being processed, and `STOP REPLICATION` was requested. This issue also prevented graceful server shutdown, requiring process termination or system restart. (Bug #115966, Bug #37008345)

Find the complete list of bug fixes and changes in the [MySQL 8.0.41 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-16</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.7.1-1</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.35-32</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.7.0</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.41</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.41</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.40 using Percona Server for MySQL (2025-01-02)

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is based on [Percona Server for MySQL 8.0.40-31](#) that includes all the features and bug fixes available in the [MySQL 8.0.40 Community Edition](#) and enterprise-grade features developed by Percona.

## Release highlights

Improvements and bug fixes provided by Oracle for MySQL 8.0.40 and included in Percona Server for MySQL are the following:

- Changes in MySQL 8.0.33 caused queries using joins on InnoDB tables to perform worse because refactoring affected functions that were previously inline.
- The server crashed when it tried to update columns altered with NULL as the default value using the INSTANT algorithm.
- The server could crash during DELETE or UPDATE operations if a column was dropped using the INSTANT algorithm.
- Importing a table created under a different sql\_mode sometimes led to schema mismatches, risking data corruption in secondary indexes. The fix now includes integrity checks on the imported tablespace.
- Rebuilding tables with secondary indexes required more file I/O operations compared to MySQL 8.0.26, which slowed down query performance.

Find the complete list of bug fixes and changes in the [MySQL 8.0.40 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-15</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.7.1-1</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.35-31</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.7.0</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.40</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.40</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.39 using Percona Server for MySQL (2024-10-08)

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is based on [Percona Server for MySQL 8.0.39-30](#) that includes all the features and bug fixes available in the [MySQL 8.0.38 Community Edition](#) and [MySQL 8.0.39 Community Edition](#) and enterprise-grade features developed by Percona.

## Release highlights

Improvements and bug fixes provided by Oracle for MySQL 8.0.38, MySQL 8.0.39 and included in Percona Server for MySQL are the following:

- The server could not restart successfully after creating a large number of tables (8001 or more). This issue, Bug #36808732, is a regression of Bug #33398681.
- Enhanced performance of tablespace file scanning during startup. (Bug #110402, Bug #35200385)
- InnoDB file system operations now consistently perform an fsync on the parent directory when carrying out directory-altering tasks. (Bug #36174938)
- Worker jobs now include details about the relay log file that initiated the transaction, rather than relying on the default specified by `relay_log`.

Find the complete list of bug fixes and changes in the [MySQL 8.0.38 Release Notes](#) and [MySQL 8.0.39 Release Notes](#).

## Supplied components

Review each component’s release notes for What’s new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-14</a>	The replication topology manager for Percona Server for MySQL

Component	Version	Description
ProxySQL	<a href="#">2.6.5</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.35-30</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.6.0</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.38</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.39</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.38 using Percona Server for MySQL

Due to a critical fix, MySQL Community Server 8.0.39 was released shortly (22 days later) after MySQL Community Server 8.0.38. Percona has skipped the release of Percona Server for MySQL 8.0.38. Percona Server for MySQL 8.0.39 contains all bug fixes and contents from MySQL Community Server 8.0.38 and MySQL Community Server 8.0.39.

# Percona Distribution for MySQL 8.0.37 using Percona Server for MySQL Update (2024-08-06)

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

## Release highlights

This release enhances telemetry and provides a more comprehensive explanation of how the telemetry works, including new components, metrics files, and additional methods for disabling telemetry. Find more information in the [Telemetry on Percona Server for MySQL](#) document.

Improvements and bug fixes provided by Oracle for MySQL 8.0.37 and included in Percona Server for MySQL are the following:

- The redo log might not record a change in column order when using instant DDL, potentially leading to an inaccurate log replay during the recovery process. (Bug #35183686)
- Enhanced management of buffers has been implemented in deleting tablespaces to prevent a possible assertion failure. (Bug #35676106, Bug #36343647)
- Resolved an assertion failure associated with full-text indexes. (Bug #35836581)

Find the complete list of bug fixes and changes in the [MySQL 8.0.37 Release Notes](#).

## Deprecation

- [PS-8963](#): The `SEQUENCE_TABLE()` function is deprecated and may be removed in a future release. We recommend that you use `PERCONA_SEQUENCE_TABLE()` instead. To maintain compatibility with existing third-party software, `SEQUENCE_TABLE` is no longer a reserved term and can be used as a regular identifier. Find more information in [PERCONA\\_SEQUENCE\\_TABLE\(n\) function](#)

## Packaging notes

Percona Server for MySQL 8.0.37-29 supports Ubuntu 24.04.



## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-13</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.6.3</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.35-30</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.6.0</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.37</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.37</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.36 using Percona Server for MySQL (2024-03-04)

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona Server for MySQL-based deployment variation. It is based on [Percona Server for MySQL 8.0.36-28](#).

## Release highlights

This release fixes the Orchestrator issues. Find the full list of bug fixes and changes in the [MySQL 8.0.36 Release Notes](#).

## Bug fixes

The Orchestrator version is updated from 3.2.6-11 to 3.2.6-12. The issues fixed in Orchestrator 3.2.6-12 are the following:

- [DISTMYSQL-396](#): The Orchestrator failed to handle duplicate values for alias.
- [DISTMYSQL-364](#): The Orchestrator didn't support group replication with Percona Server for MySQL.
- [DISTMYSQL-185](#): A user was receiving false errors when relocating the replicas.
- [DISTMYSQL-226](#): The Orchestrator incorrectly handled the `max_allowed_packet` setting.

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-12</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.5.5-1.2</a>	A high performance, high-availability, protocol-aware proxy for MySQL

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.35-30</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.5.7</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.36</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.36</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

**2023 (versions 8.0.35 to 8.0.30)**

# Percona Distribution for MySQL 8.0.35 using Percona Server for MySQL (2023-12-27)

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona Server for MySQL-based deployment variation. It is based on [Percona Server for MySQL 8.0.35-27](#).

## Release highlights

Percona Server for MySQL implements telemetry that fills in the gaps in our understanding of how you use Percona Server to improve our products. Participation in the anonymous program is optional. You can opt-out if you prefer not to share this information. Find more information in the [Telemetry on Percona Server for MySQL](#) document.

This merge fixes the following issue:

- [PS-8849](#): The server exited with the `Assertion failure: row0mysql.cc:218:len < 256 * 256 thread.`

Improvements and bug fixes provided by Oracle for MySQL 8.0.35 and included in Percona Server for MySQL are the following:

- Upgraded the linked OpenSSL library to OpenSSL 3.0.10.
- Removed the printed query string limit to display the characters for a detected deadlock section of the engine status log.
- Fixed a procession of single-character tokens by an FTS parser plugin.

## Deprecations

The following items are deprecated in this release and using any of these items may cause a warning:

- The `binlog_transaction_dependency_tracking` server system variable
- The `old` and `new` server system variables
- The `--character-set-client-handshake` server variable
- `INFORMATION_SCHEMA.PROCESSLIST` and the `SHOW PROCESSLIST` command

- The `performance_schema_show_processlist` variable

We recommend migrating from these items as soon as possible. They can be removed in a future release.

Find the full list of bug fixes and changes in the [MySQL 8.0.35 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-11</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.5.5</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.35-30</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.5.7</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.35</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.35</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.34 using Percona Server for MySQL Third Update (2023-12-23)

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the new version of [Percona Toolkit 3.5.7](#).

# Percona Distribution for MySQL 8.0.34 using Percona Server for MySQL Second Update (2023-12-21)

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the new version of [Percona Toolkit 3.5.6](#) that fixes Go security vulnerability.



# Percona Distribution for MySQL 8.0.34 using Percona Server for MySQL Update (2023-10-03)

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the new version of [Percona Toolkit 3.5.5](#) that fixes Golang security vulnerability.

# Percona Distribution for MySQL 8.0.34 using Percona Server for MySQL (2023-09-26)

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona Server for MySQL-based deployment variation. It is based on [Percona Server for MySQL 8.0.34-26](#).

## Release highlights

- Percona Server for MySQL 8.0.34-26 implements the [Audit Log Filter plugin](#). The plugin provides a set of features that you can use to monitor user activity on the selected server:
  - Filter audit events based on user/connection, accessed database/table name, query content, etc. Filtering rules are in JSON format.
  - Dynamically enable/disable the auditing. A server restart is not required to add or adjust existing filtering rules.
  - Use filtering rules to remove sensitive data from SQL statements written to log files.
  - Use filtering rules to block events matching specific criteria (for example, database/table name, user name).
  - Configure filtering rules to write to audit log extra information provided via Query Attributes with each query.
  - Encrypt the audit log files using AES-256 encryption. The plugin keeps a set of encryption passwords used to encrypt existing log files. External applications may use these passwords to access encrypted logs.
  - Compress audit log files to reduce the storage space used by log files.
  - Configure an automatic rotation and removal of log files. You can remove outdated log files based either on storage space used by log files or the age of log files.
- Percona Server for MySQL 8.0.34-26 implements the [data masking component](#), an improved and enhanced version of [data masking plugin](#). The data masking component adds the following features:
  - Support for multibyte character sets for random generation/masking functions
  - New masking functions for IBAN, UUID, Canada SIN, and UK NIN
  - New random generation functions for BAN, UUID, Canada SIN, and UK NIN

- The ability to store substitution dictionaries in the database
- The dynamic privilege `MASKING_DICTIONARIES_ADMIN` that is required for dictionary manipulation operations
- The automated loadable-function registration/unregistration during component installation/uninstallation

This merge fixes the following issue:

- [PS-8770](#): The `INSTANT DDL` caused Percona Server 8.0.32 exit after upgrading from 5.7.41.

Improvements and bug fixes introduced by Oracle for MySQL 8.0.34 and included in Percona Server for MySQL are the following:

- MySQL 8.0.33 added support for the `audit_log plugin` to choose which database to use to store JSON filter tables. Now, you can specify an alternative to the default system database, `mysql`, when running the plugin installation script. For example:

```
$> mysql -u root -D database_name -p < audit_log_filter_linux_install.sql
```

- Adds `mysql_binlog_open()`, `mysql_binlog_fetch()`, and `mysql_binlog_close()` functions to the `libmysqlclient.so` shared library. These functions enable developers to access a MySQL server binary log.
- For platforms on which OpenSSL libraries are bundled, the linked OpenSSL library for MySQL Server is updated from OpenSSL 1.1.1 to OpenSSL 3.0.9.

## Deprecations and removals

- The `mysqlpump` client utility program is deprecated. The use of this program causes a warning. The `mysqlpump` client may be removed in future releases. The applications that depend on `mysqlpump` will use `mysqldump` or `MySQL Shell Utilities`.
- The `sync_relay_log_info` server system variable is deprecated. Using this variable or its equivalent startup `--sync-relay-log-info` option causes a warning. This variable may be removed in future releases. The applications that use this variable should be rewritten not to depend on it before the variable is removed.
- The `binlog_format` server system variable is deprecated and may be removed in future releases. The functionality associated with this variable, which changes the binary logging format, is also deprecated.

When `binlog_format` is removed, MySQL server supports only row-based binary logging. Thus, new installations should use only row-based binary logging. Migrate the existing installations that use the statement-based or mixed logging format to the row-based format.

The system variables `log_bin_trust_function_creators` and `log_statements_unsafe_for_binlog` used in the context of statement-based logging are also deprecated and may be removed in future releases.

Setting or selecting the values of deprecated variables causes a warning.

- The `mysql_native_password` authentication plugin is deprecated and may be removed in future releases. Using `CREATE USER`, `ALTER USER`, and `SET PASSWORD` operations, insert a deprecation warning into the server error log if an account attempts to authenticate using `mysql_native_password` as an authentication method.
- The legacy filtering mode is deprecated. New deprecation warnings are emitted for legacy audit log filtering system variables. The deprecated variables are either read-only or dynamic.

The `audit_log_policy` read-only variable writes a warning message to the MySQL server error log during server startup when its value is set to any value except `ALL` (default value).

The `audit_log_include_accounts`, `audit_log_exclude_accounts`, `audit_log_statement_policy`, and `audit_log_connection_policy` are dynamic variables. Dynamic variables print a warning message based on usage:

- Passing in a non-NULL value to `audit_log_include_accounts` or `audit_log_exclude_accounts` during MySQL server startup writes a warning message to the server error log.
- Passing in a non-default value to `audit_log_statement_policy` or `audit_log_connection_policy` during MySQL server startup now writes a warning message to the server error log. `ALL` is the default value for both variables.
- Changing an existing value using `SET` syntax during a MySQL client session writes a warning message to the client log.
- Persisting a variable using `SET PERSIST` syntax during a MySQL client session writes a warning message to the client log.
- The `keyring_file` and `keyring_encrypted_file` plugins are deprecated. These keyring plugins are replaced with the `component_keyring_file` and `component_keyring_encrypted_file` components.

Find the full list of bug fixes and changes in the [MySQL 8.0.34 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-10</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.5.5</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.34-29</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.5.4</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.34</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.34</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.33 using Percona Server for MySQL Third Update (2023-08-02)

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the fix to the security vulnerability in `mysql-shell` [CVE-2023-38325](#).

# Percona Distribution for MySQL 8.0.33 using Percona Server for MySQL Second Update (2023-07-19)

Release date	July 19, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the new version of [Percona XtraBackup 8.0.33-28](#).

# Percona Distribution for MySQL 8.0.33 using Percona Server for MySQL Update (2023-06-30)

Release date	June 30, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the new version of [Percona Toolkit 3.5.4](#) that fixes Golang security vulnerability.



# Percona Distribution for MySQL 8.0.33 using Percona Server for MySQL (2023-06-15)

Release date	June 15, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable, and secure open source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This release is focused on the Percona Server for MySQL-based deployment variation. It is based on [Percona Server for MySQL 8.0.33-25](#).

## Release highlights

- This release adds the following MyRocks variables:
- `rocksdb_bulk_load_use_sst_partitioner`
- `rocksdb_use_hyper_clock_cache`
- `rocksdb_converter_record_cached_length`
- `rocksdb_alter_table_comment_inplace`
- `rocksdb_charge_memory`
- `rocksdb_column_default_value_as_expression`
- `rocksdb_corrupt_data_action`
- `rocksdb_disable_instant_ddl`
- `rocksdb_enable_delete_range_for_drop_index`
- `rocksdb_partial_index_blind_delete`
- `rocksdb_protection_bytes_per_key`
- `rocksdb_use_write_buffer_manager`
- This release adds a new MyRocks Information Schema Table `ROCKSDB_LIVE_FILES_METADATA`.
- This release removes `rocksdb_instant_ddl` variable. Use `rocksdb_disable_instant_ddl` instead.
- This merge fixes the following issues:

- [PS-8477](#): The offline-mode persisted when doing `dba.rebootClusterFromCompleteOutage`.
- [PS-8699](#): `ALTER INSTANCE RELOAD TLS` hung with many concurrent connection attempts. We have included the upstream fix and added our fix for this issue, which significantly reduces the chances that the issue will reoccur.

Improvements and bug fixes introduced by Oracle for MySQL 8.0.33 and included in Percona Server for MySQL are the following:

- The `INSTALL COMPONENT` includes the `SET` clause. The `SET` clause sets the values of component system variables when installing one or several components. This reduces the inconvenience and limitations associated with assigning variable values in other ways.
- The `mysqlbinlog --start-position` accepts values up to `18446744073709551615`. If the `--read-from-remote-server` or `--read-from-remote-source` option is used, the maximum is `4294967295`. (Bug #77818, Bug #21498994)
- Using a generated column with `DEFAULT(col_name)` to specify the default value for a named column is not allowed and throws an error message. (Bug #34463652, Bug #34369580)
- Not all possible error states were reported during the binary log recovery process. (Bug #33658850)
- User-defined collations are deprecated. The usage of the following user-defined collations causes a warning that is written to the log:
  - When `COLLATE` is followed by the name of a user-defined collation in an SQL statement.
  - When the name of a user-defined collation is used as the value of `collation_server`, `collation_database`, or `collation_connection`.

The support for user-defined collations will be removed in a future releases of MySQL.

Find the full list of bug fixes and changes in the [MySQL 8.0.33 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-9</a>	The replication topology manager for Percona Server for MySQL

Component	Version	Description
ProxySQL	<a href="#">2.5.1</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.33-27</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.5.3</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.33</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.33</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.32 using Percona Server for MySQL Third Update (2023-06-05)

Release date	June 05, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the new version of [Percona Toolkit 3.5.3](#) that fixes several Golang security vulnerabilities.

# Percona Distribution for MySQL 8.0.32 using Percona Server for MySQL Second Update (2023-04-04)

Release date	April 04, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the fix to the security vulnerability [CVE-2022-25834](#) with [PXB-2977](#).

# Percona Distribution for MySQL 8.0.32 using Percona Server for MySQL Update (2023-03-28)

Release date	March 28, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes the new version of [Percona Toolkit 3.5.2](#) that upgrades Golang to 1.20 version to fix several Golang security vulnerabilities.

# Percona Distribution for MySQL 8.0.32 using Percona Server for MySQL (2023-03-20)

Release date	March 20, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable, and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This release is focused on the Percona Server for MySQL-based deployment variation. It is based on [Percona Server for MySQL 8.0.32-24](#).

## Release highlights

Percona decided to revert the following MySQL bug fix:

The data and the GTIDs backed up by `mysqldump` were inconsistent when the options `--single-transaction` and `--set-gtid-purged=ON` were both used. It was because in between the transaction started by `mysqldump` and the fetching of `GTID_EXECUTED`, GTIDs on the server could have increased already. With this fixed, a `FLUSH TABLES WITH READ LOCK` is performed before the fetching of `GTID_EXECUTED` to ensure its value is consistent with the snapshot taken by `mysqldump`.

The MySQL fix also added a requirement when using `--single-transaction` and executing `FLUSH TABLES WITH READ LOCK` for the [RELOAD](#) privilege. (Bug #33630199, Bug #105761)

The current Percona decision also provides a solution for [MySQL bug #33630199](#).

The Percona Server version of the `mysqldump` utility, in some modes, can be used with MySQL Server. This utility provides a temporary workaround for the `additional RELOAD privilege` limitation introduced by Oracle MySQL Server 8.0.32.

Improvements and bug fixes introduced by Oracle for MySQL 8.0.32 and included in Percona Server for MySQL are the following:

- A replica can add a Generated Invisible Primary Keys(GIPK) to any InnoDB table. To achieve this behavior, the `GENERATE` value is added as a possible value for the `CHANGE REPLICATION SOURCE TO` statement's `REQUIRE_TABLE_PRIMARY_KEY_CHECK` option.

- The `REQUIRE_TABLE_PRIMARY_KEY_CHECK = GENERATE` option can be used on a per-channel basis.
- Setting `sql_generate_invisible_primary_key` on the source is ignored by a replica because this variable is not replicated. This behavior is inherited from the previous releases.
- An upgrade from 8.0.28 caused undetectable problems, such as server exit and corruption.
- A fix for after an upgrade, all columns added with `ALGORITHM=INSTANT` materialized and have `version=0` for any new row inserted. Now, a column added with `ALGORITHM=INSTANT` fails if the maximum possible size of a row exceeds the row size limit so that all new rows with materialized `ALGORITHM=INSTANT` columns are within the row size limit. (Bug #34558510)
- After a drop, adding a specific column using the `INSTANT` algorithm could cause a data error and a server exit. (Bug #34122122)
- An online rebuild DDL no longer crashes after a column is added with `ALGORITHM=INSTANT`. Thank you, Qingda Hu, for reporting this bug. (Bug #33788578, Bug #106279)

Find the full list of bug fixes and changes in the [MySQL 8.0.32 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-8</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.4.8</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.32-25</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.5.1</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.32</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.32</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers



# Percona Distribution for MySQL 8.0.31 using Percona Server for MySQL Update (2023-02-15)

Release date	February 15, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona Server for MySQL includes a new version of ProxySQL component [2.4.7](#).

# Percona Distribution for MySQL 8.0.31 using Percona Server for MySQL (2023-02-09)

Release date	February 9, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This release is focused on the Percona Server for MySQL-based deployment variation. It is based on [Percona Server for MySQL 8.0.31-23](#).

## Release highlights

Improvements and bug fixes introduced by Oracle for MySQL 8.0.31 and included in Percona Server for MySQL are the following:

- A replica can add a Generated Invisible Primary Keys(GIPK) to any InnoDB table. To achieve this behavior, the `GENERATE` value is added as a possible value for the `CHANGE REPLICATION SOURCE TO` statement's `REQUIRE_TABLE_PRIMARY_KEY_CHECK` option.  
`REQUIRE_TABLE_PRIMARY_KEY_CHECK = GENERATE` option can be used on a per-channel basis.  
Setting `sql_generate_invisible_primary_key` on the source is ignored by a replica because this variable is not replicated. This behavior is inherited from the previous releases.
- MySQL adds support for the SQL standard [INTERSECT](#) and [EXCEPT](#) table operators.
- InnoDB supports parallel index builds. This improves index build performance. The sorted index entries are loaded into a B-tree in a multithread. In previous releases, this action was performed by a single thread.
- The Performance and sys schemas show metrics for the global and session memory limits introduced in MySQL 8.0.28.

The following columns have been added to the Performance Schema tables:

Performance Schema tables	Columns
SETUP_INSTRUMENTS	FLAGS
THREADS	CONTROLLED_MEMORY, MAX_CONTROLLED_MEMORY, TOTAL_MEMORY, MAX_TOTAL_MEMORY
EVENTS_STATEMENTS_CURRENT, EVENTS_STATEMENTS_HISTORY, EVENTS_STATEMENTS_HISTORY_LONG	MAX_CONTROLLED_MEMORY, MAX_TOTAL_MEMORY
Statement Summary Tables	MAX_CONTROLLED_MEMORY, MAX_TOTAL_MEMORY
Performance Schema Connection Tables	MAX_SESSION_CONTROLLED_MEMORY, MAX_SESSION_TOTAL_MEMORY
PREPARED_STATEMENTS_INSTANCES	MAX_CONTROLLED_MEMORY, MAX_TOTAL_MEMORY

The following columns have been added to the sys schema `STATEMENT_ANALYSIS` and `X$STATEMENT_ANALYSIS` views:

- `MAX_CONTROLLED_MEMORY`
- `MAX_TOTAL_MEMORY`

The `controlled_by_default` flag has been added to the `PROPERTIES` column of the `SETUP_INSTRUMENTS` table.

Now, you can add and remove non-global memory instruments to the set of controlled-memory instruments. To do this, set the value of the `FLAGS` column of `SETUP_INSTRUMENTS`.

```
SQL> UPDATE PERFORMANCE_SCHEMA.SETUP_INSTRUMENTS SET FLAGS="controlled"
WHERE NAME='memory/sql/NET::buff';
```

- The `audit_log_flush` variable has been deprecated and will be removed in future releases.

Find the full list of bug fixes and changes in the [MySQL 8.0.31 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-7</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.4.4-1.2</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.31-24</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.5.1</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.31</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.31</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.30 using Percona Server for MySQL Second Update (2023-01-23)

Release date	January 23, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This update to the release of Percona Distribution for MySQL using the *Percona Server for MySQL* includes a new version of [Percona Toolkit 3.5.1](#) that fixes the security vulnerability [CVE-2022-32149](#).

# Percona Distribution for MySQL 8.0.30 using Percona Server for MySQL Update (2023-01-06)

Release date	January 6, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This update to the release of Percona Distribution for MySQL using the *Percona Server for MySQL* includes a new version of *setuptools* 65.6.3 in *mysql-shell* packages. With that, it fixes the security vulnerability [CVE-2022-40897](#).

**2022 (versions 8.0.30 to 8.0.27)**

# Percona Distribution for MySQL 8.0.30 using Percona Server for MySQL (2022-11-29)

Release date	November 29, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open-source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release is focused on the *Percona Server for MySQL*-based deployment variant. It is based on [Percona Server for MySQL 8.0.30-22](#).

## Release Highlights

The following features are [Generally Available \(GA\)](#):

- [Amazon Key Management Service](#)
- [Key Management Interoperability Protocol](#)

The following features, variables, or options are available only in [tech preview](#):

- [SASL-based LDAP plugin](#)
- [SASL-based LDAP variables](#)
- [Fallback server variables for simple LDAP and SASL-based LDAP](#)
- [FIDO authentication plugin](#)
- Group Replication options

Improvements and bug fixes introduced by Oracle for *MySQL* 8.0.30 and included in *Percona Server for MySQL* are the following:



- Support of Generated Invisible Primary Keys(GIPK). This feature automatically adds a primary key to InnoDB tables without a primary key. The generated key is always named `my_row_id`. The GIPK feature is not enabled by default. Enable the feature by setting `sql_generate_invisible_primary_key` to ON.
- Added two new settings to the InnoDB\_doublewrite system:
- `DETECT_ONLY`. This setting allows only metadata to be written to the doublewrite buffer. Database page content is not written to the buffer. Recovery does not use the buffer to fix incomplete page writes. Use this setting only when you need to detect incomplete page writes.
- `DETECT_AND_RECOVER`. This setting is equivalent to the current ON setting. The doublewrite buffer is enabled. Database page content is written to the buffer and the buffer is accessed to fix incomplete page writes during recovery.
- The `-skip_host_cache` server option is deprecated and will be removed in a future release. Use `SET GLOBAL host_cache_size = 0` or set `host_cache_size = 0`.

Find the full list of bug fixes and changes in the [MySQL 8.0.30 Release Notes](#).

The following is the list of components supplied with *Percona Server for MySQL*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-6</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.4.4-1.2</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.30-23</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.5.0</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.30</a>	An advanced client and code editor for MySQL Server
MySQL Router	<a href="#">8.0.30</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

## Packaging notes

Percona Distribution for MySQL 8.0.30 using Percona Server for MySQL is available on Ubuntu 22.04 (jammy).

# Percona Distribution for MySQL 8.0.29 using Percona Server for MySQL (2022-08-09)

Release date	August 8, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open-source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release is focused on the *Percona Server for MySQL*-based deployment variant. It is based on [Percona Server for MySQL 8.0.29-21](#).

## Release Highlights

The following lists a number of the bug fixes for *MySQL 8.0.29*, provided by Oracle, and included in *Percona Server for MySQL* and *Percona Distribution for MySQL*:

- The Performance Schema tracks if a query was processed on the PRIMARY engine, InnoDB, or a SECONDARY engine, HeatWave. An EXECUTION\_ENGINE column, which indicates the engine used, was added to the Performance Schema statement event tables and the `sys.processlist` and the `sys.x$processlist` views.
- Added support for the IF NOT EXISTS option for the CREATE FUNCTION, CREATE PROCEDURE, and CREATE TRIGGER statements.
- Added support for ALTER TABLE ... DROP COLUMN ALGORITHM=INSTANT.
- An anonymous user with the PROCESS privilege was unable to select processlist table rows.

Find the full list of bug fixes and changes in the [MySQL 8.0.29 Release Notes](#).



#### Note

Percona Server for MySQL has changed the default for [supported DDL column operations](#) to `ALGORITHM=INPLACE`. This fixes corruption issue and several other issues with the `INSTANT ADD/DROP COLUMN DDL` (Find more details in [PS-8292](#), [PS-8291](#) and [PS-8303](#)).

In MySQL 8.0.29, the default setting for supported DDL operations is `ALGORITHM=INSTANT`. You can explicitly specify `ALGORITHM=INSTANT` in DDL column operations.

For more information, see [Percona Blog: Percona XtraBackup 8.0.29 and INSTANT ADD/DROP Columns](#).

## Orchestrator

- [DISTMYSQL-198](#): orchestrator client packages were missing for RPM based distributions. Starting from v8.0.29 they are now built and available for download.
- [DISTMYSQL-197](#): Option `--version` now returns a more understandable version number (in addition to the commit hash).

## Packaging Notes

Debian 9 ("Stretch") is no longer supported. To learn more, see [Percona Blog: OS Platform End of Life \(EOL\) Announcement for Debian Linux 9](#)

The following is the list of components supplied with *Percona Server for MySQL*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	<a href="#">3.2.6-3</a>	The replication topology manager for Percona Server for MySQL
ProxySQL	<a href="#">2.3.2</a>	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	<a href="#">8.0.29-22</a>	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	<a href="#">3.4.0</a>	The set of scripts to simplify and optimize database operation
MySQL Shell	<a href="#">8.0.29</a>	An advanced client and code editor for MySQL Server

Component	Version	Description
MySQL Router	<a href="#">8.0.29</a>	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.28 using Percona Server for MySQL Update (2022-06-20)

Release date	June 20, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open-source community, designed and tested to work together.

This update of Percona Distribution for MySQL using Percona Server for MySQL is based on [Percona Server for MySQL 8.0.28-20](#).

It also includes the updated version of [Percona Xtrabackup 8.0.28-21](#).

## Release Highlights

- [Encryption functions and variables](#) to manage the encryption range are added. The functions may take an algorithm argument. Encryption converts plaintext into ciphertext using a key and an encryption algorithm.

You can also use the user-defined functions with the PEM format keys generated externally by the OpenSSL utility.

- Support for the [Amazon Key Management Service \(AWS KMS\) component](#).
- Error messages are now logged to a memory buffer.
- ZenFS file system plugin for RocksDB is updated to version 2.1.0.
- Memory leak and errors detectors (Valgrind or AddressSanitizer) provide detailed stack traces from dynamic libraries (plugins and components). The detailed stack traces make it easier to identify and fix the issues.

Other components, supplied with Percona Distribution for MySQL, remain unchanged.

# Percona Distribution for MySQL 8.0.28 using Percona Server for MySQL (2022-05-12)

Release date	May 12, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open-source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona Server for MySQL*-based deployment variant. It is based on [Percona Server for MySQL 8.0.28-19](#).

## Release Highlights

The following lists a number of the bug fixes for MySQL 8.0.28, provided by Oracle, and included in Percona Server for MySQL and Percona Distribution for MySQL:

- The `ASCII` shortcut for `CHARACTER SET latin1` and `UNICODE` shortcut for `CHARACTER SET ucs2` are deprecated and raise a warning to use `CHARACTER SET` instead. The shortcuts will be removed in a future version.
- A stored function and a loadable function with the same name can share the same namespace. Add the schema name when invoking a stored function in the shared namespace. The server generates a warning when function names collide.
- InnoDB supports `ALTER TABLE ... RENAME COLUMN` operations when using `ALGORITHM=INSTANT`.
- The limit for `innodb_open_files` now includes temporary tablespace files. The temporary tablespace files were not counted in the `innodb_open_files` in previous versions.

Find the full list of bug fixes and changes in the [MySQL 8.0.28 Release Notes](#).

## Orchestrator

[DISTMYSQL-141](#): In complicated environments, such as 3 or more datacenters, or when each server has more than 2 intermediary masters, Orchestrator could miss replication delays in one or more datacenters. This was happening due to a hard-coded limitation of two intermediary masters to check for the replication delay. This is now fixed.

---

The following is the list of components supplied with *Percona Server for MySQL*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	3.2.6	The replication topology manager for Percona Server for MySQL
ProxySQL	2.3.2	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	8.0.28-20.0	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation
MySQL Shell	8.0.28	An advanced client and code editor for MySQL Server
MySQL Router	8.0.28	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers



# Percona Distribution for MySQL 8.0.27 using Percona Server for MySQL (2022-03-03)

Release date	March 03, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open-source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona Server for MySQL*-based deployment variant. It is based on [Percona Server for MySQL 8.0.27-18](#).

## Release Highlights

The following list are some of the bug fixes for *MySQL* 8.0.27, provided by Oracle, and included in *Percona Server for MySQL* and *Percona Distribution for MySQL*:

- The `default_authentication_plugin` is deprecated. Support for this plugin may be removed in future versions. Use the `authentication_policy` variable.
- The `binary` operator is deprecated. Support for this operator may be removed in future versions. Use `CAST(... AS BINARY)`.
- Fix for when a parent table initiates a cascading `SET NULL` operation on the child table, the virtual column can be set to NULL instead of the value derived from the parent table.

## Packaging Notes

- Red Hat Enterprise Linux 6 (and derivative Linux distributions) are no longer supported.

## Known issues

The RPM packages for Red Hat Enterprise Linux 7 (and compatible derivatives) do not support TLSv1.3, as it requires OpenSSL 1.1.1, which is currently not available on this platform.

---

The following is the list of components supplied with *Percona Server for MySQL*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	3.2.6	The replication topology manager for Percona Server for MySQL
ProxySQL	2.3.2	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	8.0.27-17.0	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation
MySQL Shell	8.0.27	An advanced client and code editor for MySQL Server
MySQL Router	8.0.27	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

**2021 (versions 8.0.26 to 8.0.23)**

# Percona Distribution for MySQL 8.0.26 using Percona Server for MySQL (2021-10-20)

Release date	October 20, 2021
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open-source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona Server for MySQL*-based deployment variant. It is based on [Percona Server for MySQL 8.0.26-16](#).

## Release Highlights

The TokuDB Storage Engine has been declared deprecated starting with *Percona Server for MySQL* 8.0.26-16. The plugins are available in the binary builds and packages but are disabled. New options have been added to enable the plugins if they are needed to migrate the data to another storage engine. Read more in the [TokuDB documentation](#).

The following is the list of bug fixes for MySQL 8.0.26, provided by Oracle, and included in Percona Server for MySQL and Percona Distribution for MySQL:

- [#104575](#): In the PERFORMANCE\_SCHEMA.Threads table, the `srv_purge_thread` and `srv_worker_thread` values are duplicated.
- [#104387](#): When using REGEX comparison, a CHARACTER\_SET\_MISMATCH error is thrown.
- [#104576](#): Accessing the second index in a partition table with many columns can create a high CPU load.

The following is the list of components supplied with *Percona Server for MySQL*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Orchestrator	3.2.5	The replication topology manager for Percona Server for MySQL
ProxySQL	2.2.0	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	8.0.26-17.0	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation
MySQL Shell	8.0.26	An advanced client and code editor for MySQL Server
MySQL Router	8.0.26	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.25 using Percona Server for MySQL (2021-07-13)

Release date	July 13, 2021
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona Server for MySQL*-based deployment variant. It is based on [Percona Server for MySQL 8.0.25-15](#) and includes the following components:

Component	Version	Description
Orchestrator	3.2.5	The replication topology manager for Percona Server for MySQL
ProxySQL	2.1.1	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	8.0.25-17.0	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation
MySQL Shell	8.0.25	An advanced client and code editor for MySQL Server
MySQL Router	8.0.25	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

# Percona Distribution for MySQL 8.0.23 using Percona Server for MySQL (2021-05-12)

Release date	May 12, 2021
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona Server for MySQL*-based deployment variant. It is based on [Percona Server for MySQL 8.0.23-14](#) and includes the following components:

Component	Version	Description
Orchestrator	3.2.4	The replication topology manager for Percona Server for MySQL
ProxySQL	2.0.18	A high performance, high-availability, protocol-aware proxy for MySQL
Percona XtraBackup	8.0.23-16.0	An open-source hot backup utility for MySQL-based servers
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation
MySQL Shell	8.0.23	An advanced client and code editor for MySQL Server
MySQL Router	8.0.23	Lightweight middleware that provides transparent routing between your application and back-end MySQL servers

**2020 (versions 8.0.22 to 8.0.19)**



# Percona Distribution for MySQL 8.0.22 using Percona Server for MySQL (2020-12-14)

Release date	December 14, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*. This enables you to choose the MySQL deployment approach that best meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible [components](#).

This release of Percona Distribution for MySQL is focused on the *Percona Server for MySQL*-based deployment variant and is based on [Percona Server for MySQL 8.0.22-13](#).

# Percona Distribution for MySQL 8.0.21 using Percona Server for MySQL (2020-10-13)

Release date	October 13, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*. This enables you to choose the MySQL deployment approach that best meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible [components](#).

This release of Percona Distribution for MySQL fixes the security vulnerability [CVE-2020-26542](#). It is focused on the *Percona Server for MySQL*-based deployment variant and is based on *Percona Server for MySQL* 8.0.21-12.

# Percona Distribution for MySQL 8.0.20 using Percona Server for MySQL (2020-07-21)

Release date	July 21, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*. This enables you to choose the MySQL deployment approach that best meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible [components](#).

This release of Percona Distribution for MySQL is focused on the *Percona Server for MySQL*-based deployment variant and is based on *Percona Server for MySQL* 8.0.20-11.

# Percona Distribution for MySQL 8.0.19 (2020-06-22)

Release date	June 22, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together. By leveraging the distribution, you get the exact combination of software and tools required to successfully deploy, run and operate your MySQL databases to meet your application and business needs.

Percona Distribution for MySQL consists of the following components:

- [Percona Server for MySQL](#) is a drop-in replacement for MySQL Community Edition with the enterprise-grade features embedded by Percona.
- [Percona XtraDB Cluster](#) is the high-available clustering solution for MySQL. It is based on *Percona Server for MySQL* and uses *Percona XtraBackup* for node provisioning.
- [Percona XtraBackup](#) is an open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
- [Orchestrator](#) is the replication topology manager for *Percona Server for MySQL*.
- [HAProxy](#) is the default high-availability and load-balancing solution for *Percona XtraDB Cluster*.
- [ProxySQL](#) is a high performance, high-availability, protocol-aware proxy for MySQL.
- [Percona Toolkit](#) is the set of scripts to simplify and optimize database operation.
- [MySQL Shell](#) is an advanced client and code editor for MySQL Server.
- [MySQL Router](#) is lightweight middleware that provides transparent routing between your application and back-end MySQL Servers.

Percona Distribution for MySQL provides two deployment variants: one is *Percona Server for MySQL*-based and another one is *Percona XtraDB Cluster*-based. This enables you to build MySQL ecosystem that meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible components.

This release of Percona Distribution for MySQL is based on *Percona Server for MySQL* 8.0.19 and *Percona XtraDB Cluster* 8.0.19.

# **Percona Distribution for MySQL using Percona XtraDB Cluster**

# Percona Distribution for MySQL 8.0.41 using Percona XtraDB Cluster (2025-03-13)

Percona Distribution for MySQL is more than just a version of MySQL; it is a comprehensive solution that combines Percona Server for MySQL with additional tools to create a cohesive environment. This distribution is reliable, scalable, and secure, ensuring that all components have been tested to work seamlessly together. You can choose from two download options: one that uses Percona Server for MySQL and another that utilizes Percona XtraDB Cluster. Refer to [Install Percona Distribution for MySQL](#).

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.41-32](#).

## Release highlights

Percona XtraDB Cluster is based on Percona Server for MySQL. Find a complete list of improvements and bug fixes in the [Percona Server for MySQL 8.0.41-32 \(2025-03-\) release notes](#).

### Percona XtraDB Cluster 8.0.41-32

Implements the [Clone plugin for State Snapshot Transfer \(SST\) Method](#). The Clone SST is a modern and efficient method that leverages MySQL's native cloning capabilities to transfer data from a donor node to a Joiner node. It is faster and more resource-efficient compared to traditional methods like xtrabackup or rsync.

### Percona Server for MySQL 8.0.41-32

- Extends the [Encryption user-defined functions](#) with the following:
  - Added support for `pkcs1`, `oaep`, or `no` padding for RSA encrypt and decrypt operations
  - Added support for `pkcs1` or `pkcs1_pss` padding for RSA sign and verify operations
  - Added the `encryption_udf.legacy_padding_scheme` system variable to manage legacy padding schemes
  - Added the character set awareness
- Improves the [Data masking](#) performance by introducing an internal term cache. The new cache speeds up lookups for `gen_blocklist()` and `gen_dictionary()` functions by storing dictionary data in memory.

Find more detailed information in the [Data masking overview](#) and in the [Data masking component functions](#).

## MySQL 8.0.41

Improvements and bug fixes provided by Oracle for MySQL 8.0.41 and included in Percona Server for MySQL are the following:

- Fixed an assertion in debug builds where certain IO buffer serializations caused system hangs. (Bug #37139618)
- Resolved a failure when dropping the primary key and adding a new `AUTO_INCREMENT` column as the primary key in descending order using the `INPLACE` algorithm resulted in failure. (Bug #36658450)
- Fixed incorrect results, including missing rows, in queries that used a descending primary key with the `index_merge` optimization. (Bug #106207, Bug #33767814)
- Addressed a replication channel issue where MySQL failed to stop the channel properly when large transactions were being processed, and `STOP REPLICATION` was requested. This issue also prevented graceful server shutdown, requiring process termination or system restart. (Bug #115966, Bug #37008345)

Find the complete list of bug fixes and changes in the [MySQL 8.0.41 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.35-32</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.8.14</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.7.1-1</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.7.0</a>	The set of scripts to simplify and optimize database operation.

Component	Version	Description
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.



# Percona Distribution for MySQL 8.0.40 using Percona XtraDB Cluster (2025-01-23)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.40-31](#).

## Release highlights

Percona XtraDB Cluster is based on Percona Server for MySQL. Find a complete list of improvements and bug fixes in the [Percona Server for MySQL 8.0.40-31 \(2024-12-30\) release notes](#).

Improvements and bug fixes provided by Oracle for MySQL 8.0.40 and included in Percona Server for MySQL are the following:

- Changes in MySQL 8.0.33 caused queries using joins on InnoDB tables to perform worse because refactoring affected functions that were previously inline.
- An unexpected exit occurred if the server tried to update columns altered with NULL as the default value using the INSTANT algorithm.
- An unexpected exit during DELETE or UPDATE operations if a column, using the INSTANT algorithm, was dropped.
- Importing a table created under a different `sql_mode` sometimes led to schema mismatches, risking data corruption in secondary indexes. The fix now includes integrity checks on the imported tablespace.
- Rebuilding tables with secondary indexes required more file I/O operations compared to MySQL 8.0.26, which slowed down query performance.

Find the complete list of bug fixes and changes in the [MySQL 8.0.40 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.35-32</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.8.11</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.7.1-1</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.7.0</a>	The set of scripts to simplify and optimize database operation.
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

# Percona Distribution for MySQL 8.0.39 using Percona XtraDB Cluster (2024-12-02)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.39-30](#). [Percona XtraDB Cluster 8.0.38](#) was skipped.

## Release highlights

Percona XtraDB Cluster is based on Percona Server for MySQL. Find a complete list of improvements and bug fixes in the [Percona Server for MySQL 8.0.39-30 \(2024-10-08\) release notes](#).

The release also installs Percona Telemetry. Find more information in the [Telemetry on Percona XtraDB Cluster](#) document.

Improvements and bug fixes provided by Oracle for MySQL 8.0.38 and MySQL 8.0.39 and included in Percona XtraDB Cluster are the following:

- The server could not restart successfully after creating a large number of tables (8001 or more). This issue, Bug #36808732, is a regression of Bug #33398681.
- Enhanced performance of tablespace file scanning during startup. (Bug #110402, Bug #35200385)
- InnoDB file system operations now consistently perform an fsync on the parent directory when carrying out directory-altering tasks. (Bug #36174938)
- Worker jobs now include details about the relay log file that initiated the transaction, rather than relying on the default specified by `relay_log`.

Find the complete list of bug fixes and changes in the [MySQL 8.0.38 Release Notes](#) and [MySQL 8.0.39 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.35-30</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.8.11</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.7.1</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.6.0</a>	The set of scripts to simplify and optimize database operation.
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

# Percona Distribution for MySQL 8.0.38 using Percona XtraDB Cluster

Due to a critical fix, MySQL Community Server 8.0.39 was released shortly (22 days later) after MySQL Community Server 8.0.38. Percona has skipped the release of Percona Server for MySQL 8.0.38 and Percona XtraDB Cluster 8.0.38. Percona XtraDB Cluster 8.0.39-30 is based on Percona Server for MySQL 8.0.39-30, which contains all bug fixes and contents from MySQL Community Server 8.0.38 and MySQL Community Server 8.0.39.

# Percona Distribution for MySQL 8.0.37 using Percona XtraDB Cluster (2024-09-18)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.37](#)

## Release highlights

This release enhances telemetry and provides a more comprehensive explanation of how the telemetry works, including new components, metrics files, and additional methods for disabling telemetry. Find more information in the [Telemetry on Percona XtraDB Cluster](#) document.

Improvements and bug fixes provided by Oracle for MySQL 8.0.37 and included in Percona Server for MySQL are the following:

- The redo log might not record a change in column order when using instant DDL, potentially leading to an inaccurate log replay during the recovery process. (Bug #35183686)
- Enhanced management of buffers has been implemented in deleting tablespaces to prevent a possible assertion failure. (Bug #35676106, Bug #36343647)
- Resolved an assertion failure associated with full-text indexes. (Bug #35836581)

Find the complete list of bug fixes and changes in the [MySQL 8.0.37 Release Notes](#).

## Packaging notes

Percona XtraDB Cluster 8.0.37-29 supports Ubuntu 24.04.

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.35-30</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.8.10</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.6.5</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.6.0</a>	The set of scripts to simplify and optimize database operation.
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

# Percona Distribution for MySQL 8.0.36 using Percona XtraDB Cluster (2024-04-03)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.36](#)

## Release highlights

Improvements and bug fixes provided by Oracle for MySQL 8.0.36 and included in Percona XtraDB Cluster are the following:

- The hashing algorithm employed yielded poor performance when using a HASH field to check for uniqueness. (Bug #109548, Bug #34959356)
- All [statement instrument elements](#) that begin with `statement/sp/%`, except `statement/sp/stmt`, are disabled by default.

Find the complete list of bug fixes and changes in the [MySQL 8.0.36 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.35-30</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.8.5</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.5.5-1.2</a>	A high performance, high-availability, protocol-aware proxy for MySQL.



Component	Version	Description
Percona Toolkit	<a href="#">3.5.7</a>	The set of scripts to simplify and optimize database operation.
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

# Percona Distribution for MySQL 8.0.35 using Percona XtraDB Cluster (2024-01-17)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.35](#)

## Release highlights

Improvements and bug fixes provided by Oracle for MySQL 8.0.35 and included in Percona Server for MySQL are the following:

- Upgraded the linked OpenSSL library to OpenSSL 3.0.10.
- Removed the printed query string limit to display the characters for a detected deadlock section of the engine status log.
- Fixed a procession of single-character tokens by an FTS parser plugin.

## Deprecations

A future release may remove deprecated variables and options. The usage of these deprecated items may cause a warning. We recommend migrating from deprecated variables and options as soon as possible.

This release deprecates the following variables and options:

- The `binlog_transaction_dependency_tracking` server system variable
- The `old` and `new` server system variables
- The `--character-set-client-handshake` server variable
- `INFORMATION_SCHEMA.PROCESSLIST`
- The implementation of the `SHOW PROCESSLIST` command that uses the `INFORMATION_SCHEMA.PROCESSLIST` table
- The `performance_schema_show_processlist` variable

Find the full list of bug fixes and changes in the [MySQL 8.0.35 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.35-30</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.8.5</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.5.5</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.5.7</a>	The set of scripts to simplify and optimize database operation.
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

**2023 (versions 8.0.35 to 8.0.30)**

# Percona Distribution for MySQL 8.0.34 using Percona XtraDB Cluster Second Update (2023-12-23)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona XtraDB Cluster includes the new version of [Percona Toolkit 3.5.7](#).

# Percona Distribution for MySQL 8.0.34 using Percona XtraDB Cluster Update (2023-12-21)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona XtraDB Cluster includes the new version of [Percona Toolkit 3.5.6](#) that fixes Go security vulnerability.

# Percona Distribution for MySQL 8.0.34 using Percona XtraDB Cluster (2023-11-01)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.34](#)

## Release highlights

Percona XtraDB Cluster 8.0.34-26 implements telemetry that fills in the gaps in our understanding of how you use Percona XtraDB Cluster to improve our products. Participation in the anonymous program is optional. You can opt-out if you prefer not to share this information. Find more information in the [Telemetry on Percona XtraDB Cluster](#) document.

Improvements and bug fixes introduced by Oracle for MySQL 8.0.34 and included in Percona XtraDB Cluster are the following:

- Adds `mysql_binlog_open()`, `mysql_binlog_fetch()`, and `mysql_binlog_close()` functions to the `libmysqlclient.so` shared library. These functions enable developers to access a MySQL server binary log.
- For platforms on which OpenSSL libraries are bundled, the linked OpenSSL library for MySQL Server is updated from OpenSSL 1.1.1 to OpenSSL 3.0.9.

## Deprecations and removals

- The `mysqlpump` client utility program is deprecated. The use of this program causes a warning. The `mysqlpump` client may be removed in future releases. The applications that depend on `mysqlpump` will use `mysqldump` or `MySQL Shell Utilities`.
- The `sync_relay_log_info` server system variable is deprecated. Using this variable or its equivalent startup `--sync-relay-log-info` option causes a warning. This variable may be removed in future releases. The applications that use this variable should be rewritten not to depend on it before the variable is removed.

- The `binlog_format` server system variable is deprecated and may be removed in future releases. The functionality associated with this variable, which changes the binary logging format, is also deprecated.

When `binlog_format` is removed, MySQL server supports only row-based binary logging. Thus, new installations should use only row-based binary logging. Migrate the existing installations that use the statement-based or mixed logging format to the row-based format.

The system variables `log_bin_trust_function_creators` and `log_statements_unsafe_for_binlog` used in the context of statement-based logging are also deprecated and may be removed in future releases.

Setting or selecting the values of deprecated variables causes a warning.

- The `mysql_native_password` authentication plugin is deprecated and may be removed in future releases. Using `CREATE USER`, `ALTER USER`, and `SET PASSWORD` operations, insert a deprecation warning into the server error log if an account attempts to authenticate using `mysql_native_password` as an authentication method.
- The `keyring_file` and `keyring_encrypted_file` plugins are deprecated. These keyring plugins are replaced with the `component_keyring_file` and `component_keyring_encrypted_file` components.

Find the full list of bug fixes and changes in the [MySQL 8.0.33 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.34-29</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.8.1</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.5.5</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.5.5</a>	The set of scripts to simplify and optimize database operation.



Component	Version	Description
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

# Percona Distribution for MySQL 8.0.33 using Percona XtraDB Cluster Update (2023-10-03)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona XtraDB Cluster includes the new version of [Percona Toolkit 3.5.5](#) that fixes Golang security vulnerability.

# Percona Distribution for MySQL 8.0.33 using Percona XtraDB Cluster (2023-08-02)

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster. [Install Percona Distribution for MySQL](#).

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.33](#)

## Release highlights

The HAProxy version is updated from 2.6.12 to 2.8.1. The changes introduced by HAProxy 2.7.0 are the following:

- The `bind-process` directive is removed.
- The `process` argument on a bind line is removed.

HAProxy 2.8 introduces two new preprocessor functions:

- The `strstr` function returns `true` when a given string is found within another string.
- The `enabled` function returns `true` when the passed in option is enabled at runtime. You can check the following options: `POLL`, `EPOLL`, `KQUEUE`, `EVPORTS`, `SPLICE`, `GETADDRINFO`, `REUSEPORT`, `FAST-FORWARD`, and `SERVER-SSL-VERIFY-NONE`.

Find the full list of changes in the [HAProxy 2.8.1 release notes](#), [Announcing HAProxy 2.7 blog post](#), and in the [Announcing HAProxy 2.8 blog post](#).

Improvements and bug fixes introduced by Oracle for MySQL 8.0.33 and included in Percona XtraDB Cluster and Percona Distribution for MySQL are the following:

- The `INSTALL COMPONENT` includes the `SET` clause. The `SET` clause sets the values of component system variables when installing one or several components. This reduces the inconvenience and limitations associated with assigning variable values in other ways.
- The `mysqlbinlog --start-position` accepts values up to `18446744073709551615`. If the `--read-from-remote-server` or `--read-from-remote-source` option is used, the maximum is `4294967295`. (Bug #77818, Bug #21498994)

- Using a generated column with `DEFAULT(col_name)` to specify the default value for a named column is not allowed and throws an error message. (Bug #34463652, Bug #34369580)
- Not all possible error states were reported during the binary log recovery process. (Bug #33658850)
- User-defined collations are deprecated. The usage of the following user-defined collations causes a warning that is written to the log:
  - When `COLLATE` is followed by the name of a user-defined collation in an SQL statement.
  - When the name of a user-defined collation is used as the value of `collation_server`, `collation_database`, or `collation_connection`.

The support for user-defined collations will be removed in a future releases of MySQL.

Find the full list of bug fixes and changes in the [MySQL 8.0.33 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.33-28</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.8.1</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.5.4</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.5.4</a>	The set of scripts to simplify and optimize database operation.
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

# Percona Distribution for MySQL 8.0.32 using Percona XtraDB Cluster Third Update (2023-06-30)

Release date	June 30, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona XtraDB Cluster includes the new version of [Percona Toolkit 3.5.4](#) that fixes Golang security vulnerability.

# Percona Distribution for MySQL 8.0.32 using Percona XtraDB Cluster Second Update (2023-06-05)

Release date	June 05, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona XtraDB Cluster includes the new version of [Percona Toolkit 3.5.3](#) that fixes several Golang security vulnerabilities.

# Percona Distribution for MySQL 8.0.32 using Percona XtraDB Cluster Update (2023-05-24)

Release date	May 24, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona XtraDB Cluster includes the fix for [PXC-4211](#).

# Percona Distribution for MySQL 8.0.32 using Percona XtraDB Cluster (2023-04-18)

Release date	April 18, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.32-24](#)

## Release highlights

- Percona decided to revert the following MySQL bug fix:

The data and the GTIDs backed up by `mysqldump` were inconsistent when the options `--single-transaction` and `--set-gtid-purged=ON` were both used. It was because in between the transaction started by `mysqldump` and the fetching of `GTID_EXECUTED`, GTIDs on the server could have increased already. With this fixed, a `FLUSH TABLES WITH READ LOCK` is performed before the fetching of `GTID_EXECUTED` to ensure its value is consistent with the snapshot taken by `mysqldump`.

The MySQL fix also added a requirement when using `--single-transaction` and executing `FLUSH TABLES WITH READ LOCK` for the `RELOAD` privilege. ([MySQL bug #109701](#), [MySQL bug #105761](#))

The Percona Server version of the `mysqldump` utility, in some modes, can be used with MySQL Server. This utility provides a temporary workaround for the “additional `RELOAD` privilege” limitation introduced by Oracle MySQL Server 8.0.32.

For more information, see the Percona Performance Blog [A Workaround for the “RELOAD/FLUSH\\_TABLES privilege required” Problem When Using Oracle mysqldump 8.0.32](#).

- The ProxySQL version is updated from 2.4.8 to [2.5.1](#).
- The HAProxy version is updated from 2.5.12 to 2.6.12. The changes introduced by HAProxy 2.6.0 are the following:



- The SSL engines are disabled by default. This means that the `ssl-engine` keyword does not work. The `ssl-engine` keyword may be re-enabled by building with “USE\_ENGINE=1” and ignoring the warnings.
- openssl 0.9.8 is no longer supported.
- The HTTP version in HTTP/1.1 requests does not accept `Real Time Streaming Protocol` (RTSP) unless you use the `accept-invalid-http-requests` option.
- A `h1-accept-payload-with-any-method` global directive is added. This global directive allows users using HTTP/1.0 to send a payload with `GET`, `HEAD`, and `DELETE` requests.

Find the full list of changes in the [HAProxy 2.6.12 release notes](#), [Announcing HAProxy 2.6 blog post](#), and in the [HAProxy 2.6.0 release announce](#).

Improvements and bug fixes introduced by Oracle for MySQL 8.0.32 and included in Percona XtraDB Cluster and Percona Distribution for MySQL are the following:

- A replica can add a Generated Invisible Primary Keys(GIPK) to any InnoDB table. To achieve this behavior, the `GENERATE` value is added as a possible value for the `CHANGE REPLICATION SOURCE TO` statement’s `REQUIRE_TABLE_PRIMARY_KEY_CHECK` option.
- The `REQUIRE_TABLE_PRIMARY_KEY_CHECK = GENERATE` option can be used on a per-channel basis.
- Setting `sql_generate_invisible_primary_key` on the source is ignored by a replica because this variable is not replicated. This behavior is inherited from the previous releases.
- An upgrade from 8.0.28 caused undetectable problems, such as server exit and corruption.
- A fix for after an upgrade, all columns added with `ALGORITHM=INSTANT` materialized and have `version=0` for any new row inserted. Now, a column added with `ALGORITHM=INSTANT` fails if the maximum possible size of a row exceeds the row size limit, so that all new rows with materialized `ALGORITHM=INSTANT` columns are within row size limit. (Bug #34558510)
- After a drop, adding a specific column using the INSTANT algorithm could cause a data error and a server exit. (Bug #34122122)
- An online rebuild DDL no longer crashes after a column is added with `ALGORITHM=INSTANT`. Thank you Qingda Hu for reporting this bug. (Bug #33788578, Bug #106279)

Find the full list of bug fixes and changes in the [MySQL 8.0.32 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona XtraDB Cluster-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.32-26</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.6.12</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.5.1</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.5.2</a>	The set of scripts to simplify and optimize database operation.
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

# Percona Distribution for MySQL 8.0.31 using Percona XtraDB Cluster Second Update (2023-04-04)

Release date	April 04, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona XtraDB Cluster includes a fix to the security vulnerability [CVE-2022-25834](#) with [PXB-2977](#).

# Percona Distribution for MySQL 8.0.31 using Percona XtraDB Cluster Update (2023-03-28)

Release date	March 28, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This update to the release of Percona Distribution for MySQL using the Percona XtraDB Cluster includes the new version of [Percona Toolkit 3.5.2](#) that upgrades Golang to 1.20 version to fix several Golang security vulnerabilities.

# Percona Distribution for MySQL 8.0.31 using Percona XtraDB Cluster (2023-03-15)

Release date	March 15, 2023
Install instructions	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is the most stable, scalable and secure open-source MySQL distribution, with two download options: one based on Percona Server for MySQL and one based on Percona XtraDB Cluster.

This release is focused on the Percona XtraDB Cluster-based deployment variation. It is based on [Percona XtraDB Cluster 8.0.31-23](#)

## Release highlights

This release adds the [GCache encryption and Write-Set cache encryption](#) feature in [tech preview](#).

Improvements and bug fixes introduced by Oracle for MySQL 8.0.31 and included in Percona XtraDB Cluster and Percona Distribution for MySQL are the following:

- MySQL adds support for the SQL standard [INTERSECT](#) and [EXCEPT](#) table operators.
- InnoDB supports parallel index builds. This improves index build performance. The sorted index entries are loaded into a B-tree in a multithread. In previous releases, this action was performed by a single thread.
- The Performance and sys schemas show metrics for the global and session memory limits introduced in MySQL 8.0.28.

The following columns have been added to the Performance Schema tables:

Performance Schema tables	Columns
SETUP_INSTRUMENTS	FLAGS
THREADS	CONTROLLED_MEMORY, MAX_CONTROLLED_MEMORY, TOTAL_MEMORY, MAX_TOTAL_MEMORY

Performance Schema tables	Columns
EVENTS_STATEMENTS_CURRENT, EVENTS_STATEMENTS_HISTORY, EVENTS_STATEMENTS_HISTORY_LONG	MAX_CONTROLLED_MEMORY, MAX_TOTAL_MEMORY
Statement Summary Tables	MAX_CONTROLLED_MEMORY, MAX_TOTAL_MEMORY
Performance Schema Connection Tables	MAX_SESSION_CONTROLLED_MEMORY, MAX_SESSION_TOTAL_MEMORY
PREPARED_STATEMENTS_INSTANCES	MAX_CONTROLLED_MEMORY, MAX_TOTAL_MEMORY

The following columns have been added to the sys schema `STATEMENT_ANALYSIS` and `X$STATEMENT_ANALYSIS` views:

- `MAX_CONTROLLED_MEMORY`
- `MAX_TOTAL_MEMORY`

The `controlled_by_default` flag has been added to the `PROPERTIES` column of the `SETUP_INSTRUMENTS` table.

Now, you can add and remove non-global memory instruments to the set of controlled-memory instruments. To do this, set the value of the `FLAGS` column of `SETUP_INSTRUMENTS`.

```
SQL> UPDATE PERFORMANCE_SCHEMA.SETUP_INSTRUMENTS SET FLAGS="controlled"
WHERE NAME='memory/sql/NET::buff';
```

- The `audit_log_flush` variable has been deprecated and will be removed in future releases.

Find the full list of bug fixes and changes in the [MySQL 8.0.31 Release Notes](#).

## Supplied components

Review each component's release notes for What's new, improvements, or bug fixes. The following is a list of the components supplied with the Percona Server for MySQL-based variation of the Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.31-24</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.5.12</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.4.8</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.5.1</a>	The set of scripts to simplify and optimize database operation.
relication_manager.sh	<a href="#">1.0</a>	A tool to manage multi-source replication between multiple Percona XtraDB Cluster clusters.

# Percona Distribution for MySQL 8.0.30 using Percona XtraDB Cluster Update (2023-01-23)

Release date	January 23, 2023
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This update to the release of Percona Distribution for MySQL using the *Percona XtraDB Cluster* includes the new version of [Percona Toolkit 3.5.1](#) that fixes the security vulnerability [CVE-2022-32149](#).



**2022 (versions 8.0.30 to 8.0.26)**

# Percona Distribution for MySQL 8.0.30 using Percona XtraDB Cluster (2022-12-28)

Release date	December 28, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant. It is based on [Percona XtraDB Cluster 8.0.30-22](#)

## Release highlights

The following lists a number of the bug fixes for *MySQL 8.0.30*, provided by Oracle, and included in Percona XtraDB Cluster and Percona Distribution for MySQL:

- Supports Generated Invisible Primary Keys(GIPK). This feature automatically adds a primary key to InnoDB tables without a primary key. The generated key is always named `my_row_id`. The GIPK feature is not enabled by default. Enable the feature by setting `sql_generate_invisible_primary_key` to ON.
- The InnoDB\_doublewrite system has two new settings:
- `DETECT_ONLY`. This setting allows only metadata to be written to the doublewrite buffer. Database page content is not written to the buffer. Recovery does not use the buffer to fix incomplete page writes. Use this setting only when you need to detect incomplete page writes.
- `DETECT_AND_RECOVER`. This setting is equivalent to the current ON setting. The doublewrite buffer is enabled. Database page content is written to the buffer and the buffer is accessed to fix incomplete page writes during recovery.
- The `--skip_host_cache` server option is deprecated and will be removed in a future release. Use `SET GLOBAL host_cache_size = 0` or set `host_cache_size = 0`.

Find the full list of bug fixes and changes in the [MySQL 8.0.30 Release Notes](#).



#### Note

The following Percona Server for MySQL 8.0.30 features are not supported in Percona XtraDB Cluster 8.0.30-22:

- [Amazon Key Management Service](#)
- [Key Management Interoperability Protocol](#)

The features will be supported in the next version of Percona XtraDB Cluster.

## Replication manager for Percona XtraDB Cluster

[PXC-4062](#): The [Replication manager for Percona XtraDB Cluster](#) is a [tech preview](#) feature. The replication manager helps manage [multi-source replication](#) between multiple Percona XtraDB Cluster clusters. To manage a single replica, use [Single replica manager for Percona XtraDB Cluster](#).

The following is the list of components supplied with the *Percona XtraDB Cluster*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.30-23</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.5.10</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.4.4</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.5.0</a>	The set of scripts to simplify and optimize database operation.

# Percona Distribution for MySQL 8.0.29 using Percona XtraDB Cluster Update (2022-12-01)

Release date	December 1, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This update to the release of Percona Distribution for MySQL using the *Percona XtraDB Cluster* includes the new version of [ProxySQL 2.4.4-1.2](#). With that, it fixes the security vulnerability [CVE-2022-32149](#).

# Percona Distribution for MySQL 8.0.29 using Percona XtraDB Cluster (2022-09-12)

Release date	September 12, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant. It is based on [Percona XtraDB Cluster 8.0.29-21](#)

## Release Highlights

The following lists a number of the bug fixes for MySQL 8.0.29, provided by Oracle, and included in Percona XtraDB Cluster and Percona Distribution for MySQL:

- The Performance Schema tracks if a query was processed on the PRIMARY engine, InnoDB, or a SECONDARY engine, HeatWave. An `EXECUTION_ENGINE` column, which indicates the engine used, was added to the Performance Schema statement event tables and the `sys.processlist` and the `sys.x$processlist` views.
- Added support for the `IF NOT EXISTS` option for the `CREATE FUNCTION`, `CREATE PROCEDURE`, and `CREATE TRIGGER` statements.
- Added support for `ALTER TABLE ... DROP COLUMN ALGORITHM=INSTANT`.
- An anonymous user with the `PROCESS` privilege was unable to select processlist table rows.

Find the full list of bug fixes and changes in the [MySQL 8.0.29 Release Notes](#).



#### Note

Percona Server for MySQL has changed the default for the [supported DDL column operations](#) to ALGORITHM=INPLACE. This change fixes the corruption issue with the INSTANT ADD/DROP COLUMNS (find more details in [PS-8292](#)).

In MySQL 8.0.29, the default setting for supported DDL operations is ALGORITHM=INSTANT. You can explicitly specify ALGORITHM=INSTANT in DDL column operations.

For more information, see [Percona Blog: Percona XtraBackup 8.0.29 and INSTANT ADD/DROP Columns](#).

The following is the list of components supplied with the *Percona XtraDB Cluster*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.29</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.5.6</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.4.3</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.4.0</a>	The set of scripts to simplify and optimize database operation.

# Percona Distribution for MySQL 8.0.28 using Percona XtraDB Cluster (2022-07-19)

Release date	July 19, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant. It is based on [Percona XtraDB Cluster 8.0.28-19.1](#)

## Release Highlights

The following lists a number of the bug fixes for MySQL 8.0.28, provided by Oracle, and included in Percona XtraDB Cluster and Percona Distribution for MySQL:

- The `ASCII` shortcut for `CHARACTER SET latin1` and `UNICODE` shortcut for `CHARACTER SET ucs2` are deprecated and raise a warning to use `CHARACTER SET` instead. The shortcuts will be removed in a future version.
- A stored function and a loadable function with the same name can share the same namespace. Add the schema name when invoking a stored function in the shared namespace. The server generates a warning when function names collide.
- InnoDB supports `ALTER TABLE ... RENAME COLUMN` operations when using `ALGORITHM=INSTANT`.
- The limit for `innodb_open_files` now includes temporary tablespace files. The temporary tablespace files were not counted in the `innodb_open_files` in previous versions.

Find the full list of bug fixes and changes in the [MySQL 8.0.28 Release Notes](#).

The following is the list of components supplied with the *Percona XtraDB Cluster*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	<a href="#">8.0.28</a>	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	<a href="#">2.5.6</a>	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	<a href="#">2.3.2</a>	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	<a href="#">3.4.0</a>	The set of scripts to simplify and optimize database operation.



# Percona Distribution for MySQL 8.0.27 using Percona XtraDB Cluster (2022-04-11)

Release date	April 11, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant. It is based on [Percona XtraDB Cluster 8.0.27-17.1](#)

## Release Highlights

The following lists a number of the bug fixes for *MySQL 8.0.27*, provided by Oracle, and included in Percona Server for MySQL:

- The `default_authentication_plugin` is deprecated. Support for this plugin may be removed in future versions. Use the `authentication_policy` variable.
- The `binary` operator is deprecated. Support for this operator may be removed in future versions. Use `CAST(... AS BINARY)`.
- Fix for when a parent table initiates a cascading `SET NULL` operation on the child table, the virtual column can be set to NULL instead of the value derived from the parent table.

Find the full list of bug fixes and changes in the [MySQL 8.0.27 Release Notes](#).

The following is the list of components supplied with the *Percona XtraDB Cluster*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	8.0.27	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.

Component	Version	Description
HAProxy	2.4.15	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	2.3.2	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation.

# Percona Distribution for MySQL 8.0.26 using Percona XtraDB Cluster (2022-01-17)

Release date	January 17, 2022
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant. It is based on [Percona XtraDB Cluster 8.0.26-16.1](#)

## Release Highlights

The following are some of the notable fixes for MySQL 8.0.26, provided by Oracle, and included in Percona XtraDB Cluster and Percona Distribution for MySQL:

- The [TLSv1 and TLSv1.1](#) connection protocols are deprecated.
- Identifiers with specific terms, such as “master” or “slave” are deprecated and replaced. See the [Functionality Added or Changed section in the 8.0.26 Release Notes](#) for a list of updated identifiers.

The following terms have been changed:

- The identifier `master` is changed to `source`
- The identifier `slave` is changed to `replica`
- The identifier `multithreaded slave (mts)` is changed to `multithreaded applier (mta)`
- When using semisynchronous replication, either the old version or the new version of system variables and status variables are available. You cannot have both versions installed on an instance. Be aware, the new system variables are available when you use the new version, but the old values are not. The old system variables are available when you use the old version, but the new ones are not.

In an update to 8.0.26, enable the `rpl_semi_sync_source` plugin and the `rpl_semi_sync_replica` plugin after the update has completed. Enabling these plugins before all of the nodes are updated may cause data inconsistency between the nodes.

The names are the following:

- For the source, the `rpl_semi_sync_master` plugin (`semisync_master.so` library) is the old version and the `rpl_semi_sync_source` plugin(`semisync_source.so` library) is the new version.
- For the client, the `rpl_semi_sync_slave` plugin (`semisync_slave.so` library) is the old version and the `rpl_semi_sync_replica` plugin (`semisync_replica.so` library) is the new version.

The following is the list of components supplied with the *Percona XtraDB Cluster*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	8.0.26	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	2.4.9	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	2.3.2	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation.

**2021 (versions 8.0.25 to 8.0.22)**

# Percona Distribution for MySQL 8.0.25 using Percona XtraDB Cluster (2021-11-22)

Release date	November 22, 2021
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant. It is based on [Percona XtraDB Cluster 8.0.25-15.1](#)

## Release Highlights

A [Non-Blocking Operation mode](#) for the Online Schema Upgrades in Percona XtraDB Cluster. This mode is similar to the Total Order Isolation (TOI) mode, whereas the data definition language (DDL) statement (e.g., ALTER) is executed on all nodes in sync. The difference is that in the NBO mode, the DDL statement acquires a metadata lock that locks the table or schema at a late stage of the operation, which is a more efficient locking strategy.

Note that the NBO mode is a tech preview feature. Therefore, we recommend using it in testing environments only.

The following is the list of the notable fixes for MySQL 8.0.25, provided by Oracle, and included in *Percona XtraDB Cluster* and Percona Distribution for MySQL:

- [#103980](#): Fixes the allocation of too much memory when dropping a database with many partitioned tables.
- [#103743](#): Fixes a slow startup when the tables are encrypted.

The following is the list of components supplied with the *Percona XtraDB Cluster*-based deployment variant of Percona Distribution for MySQL:

Component	Version	Description
Percona XtraBackup	8.0.25	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	2.3.14	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	2.0.18	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation.

# Percona Distribution for MySQL 8.0.23 using *Percona XtraDB Cluster* Update (2021-09-15)

Release date	September 15, 2021
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

This update of the *Percona XtraDB Cluster*-based variant of the Percona Distribution for MySQL includes the HAProxy version 2.3.14, which fixes the security vulnerability [CVE-2021-40346](#).



# Percona Distribution for MySQL 8.0.23 using Percona XtraDB Cluster (2021-06-09)

Release date	June 09, 2021
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*.

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant. It is based on [Percona XtraDB Cluster 8.0.23-14.1](#) and includes the following components:

Component	Version	Description
<i>Percona XtraBackup</i>	8.0.23	An open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
HAProxy	2.3.10	A high-availability and load-balancing solution for Percona XtraDB Cluster. This is a default proxy.
ProxySQL	2.0.18	A high performance, high-availability, protocol-aware proxy for MySQL.
Percona Toolkit	3.3.1	The set of scripts to simplify and optimize database operation.

# Percona Distribution for MySQL 8.0.22 using Percona XtraDB Cluster (2021-03-22)

Release date	March 22, 2021
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*. This enables you to choose the MySQL deployment approach that best meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible [components](#).

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant and is based on [Percona XtraDB Cluster 8.0.22-13.1](#).

**2020 (versions 8.0.23 to 8.0.19)**

# Percona Distribution for MySQL 8.0.21 using Percona XtraDB Cluster (2020-12-28)

Release date	December 28, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*. This enables you to choose the MySQL deployment approach that best meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible [components](#).

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant and is based on [Percona XtraDB Cluster 8.0.21-12.1](#).

# Percona Distribution for MySQL 8.0.20 using Percona XtraDB Cluster Second Update (2020-10-22)

Release date	October 22, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

This update to the Percona Distribution for MySQL using *Percona XtraDB Cluster* is based on *Percona XtraDB Cluster* 8.0.20-11.3.

If you are running Percona Distribution for MySQL 8.0.20 already, please update it.

# Percona Distribution for MySQL 8.0.20 using Percona XtraDB Cluster Update (2020-10-09)

Release date	October 9, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*. This enables you to choose the MySQL deployment approach that best meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible components.

This update to the Percona Distribution for MySQL using *Percona XtraDB Cluster* fixes the security vulnerability [CVE-2020-15180](#). It is based on *Percona XtraDB Cluster* 8.0.20-11.2.

# Percona Distribution for MySQL 8.0.20 using Percona XtraDB Cluster (2020-10-01)

Release date	October 1, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together.

Percona Distribution for MySQL provides two deployment variants: one is based on *Percona Server for MySQL* and another one is based on *Percona XtraDB Cluster*. This enables you to choose the MySQL deployment approach that best meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible [components](#).

This release of Percona Distribution for MySQL is focused on the *Percona XtraDB Cluster*-based deployment variant and is based on *Percona XtraDB Cluster* 8.0.20-11.

# Percona Distribution for MySQL 8.0.19 (2020-06-22)

Release date	June 22, 2020
Installation	<a href="#">Installing Percona Distribution for MySQL</a>

Percona Distribution for MySQL is a single solution with the best and most critical enterprise components from the MySQL open source community, designed and tested to work together. By leveraging the distribution, you get the exact combination of software and tools required to successfully deploy, run and operate your MySQL databases to meet your application and business needs.

Percona Distribution for MySQL consists of the following components:

- [Percona Server for MySQL](#) is a drop-in replacement for MySQL Community Edition with the enterprise-grade features embedded by Percona.
- [Percona XtraDB Cluster](#) is the high-available clustering solution for MySQL. It is based on *Percona Server for MySQL* and uses *Percona XtraBackup* for node provisioning.
- [Percona XtraBackup](#) is an open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
- [Orchestrator](#) is the replication topology manager for *Percona Server for MySQL*.
- [HAProxy](#) is the default high-availability and load-balancing solution for *Percona XtraDB Cluster*.
- [ProxySQL](#) is a high performance, high-availability, protocol-aware proxy for MySQL.
- [Percona Toolkit](#) is the set of scripts to simplify and optimize database operation.
- [MySQL Shell](#) is an advanced client and code editor for MySQL Server.
- [MySQL Router](#) is lightweight middleware that provides transparent routing between your application and back-end MySQL Servers.

Percona Distribution for MySQL provides two deployment variants: one is *Percona Server for MySQL*-based and another one is *Percona XtraDB Cluster*-based. This enables you to build MySQL ecosystem that meets your specific needs. Each variant is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and compatible components.

This release of Percona Distribution for MySQL is based on *Percona Server for MySQL* 8.0.19 and *Percona XtraDB Cluster* 8.0.19.



# Discover Percona Distribution for MySQL

# Components

Percona Distribution for MySQL consists of the following **components**:

- [Percona Server for MySQL](#) is a drop-in replacement for MySQL Community Edition with the enterprise-grade features embedded by Percona.
- [Percona XtraDB Cluster](#) is the high-available clustering solution for MySQL. It is based on [Percona Server for MySQL](#) and uses [Percona XtraBackup](#) for node provisioning.
- [Percona XtraBackup](#) is an open-source hot backup utility for MySQL-based servers that doesn't lock your database during the backup.
- [Orchestrator](#) is the replication topology manager for *Percona Server for MySQL*.
- [HAProxy](#) is the default high-availability and load-balancing solution for *Percona XtraDB Cluster*.
- [ProxySQL](#) is a high performance, high-availability, protocol-aware proxy for MySQL.
- [Percona Toolkit](#) is the set of scripts to simplify and optimize database operation.
- [MySQL Shell](#) is an advanced client and code editor for MySQL Server.
- [MySQL Router](#) is lightweight middleware that provides transparent routing between your application and back-end MySQL servers.

# Deployment variants

Percona Distribution for MySQL provides two deployment variants: one is *Percona Server for MySQL*-based and another one is *Percona XtraDB Cluster*-based. Each deployment is available via its own repository and includes the base server (*Percona Server for MySQL* or *Percona XtraDB Cluster*) and [components](#). The table below lists what components are available with each server:

Components	Percona Server for MySQL	Percona XtraDB Cluster
Orchestrator	YES	NO
HAProxy	NO	YES
ProxySQL	YES	YES
Percona XtraBackup	YES	YES
Percona Toolkit	YES	YES
MySQL Shell	YES	NO
MySQL Router	YES	NO

## What deployment variant to choose?

The **Percona Server-based deployment variant** with [asynchronous replication](#) utilizes the primary / secondary replication model. It enables you to create geographically distributed infrastructures with the support for disaster recovery. However, this deployment variant does not guarantee data consistency on all nodes at the given moment and provides high availability of up to 4 nines.

The **Percona Server-based deployment variant** with [Group Replication](#) enables you to create fault-tolerant systems with redundancy by replicating the system state to a set of servers. *Percona Server for MySQL*-based deployment with Group Replication offers a high grade of high availability (4-5 nines) and almost instant fail over when associated with a proxy.

The **Percona XtraDB Cluster-based deployment variant** guarantees data consistency on all nodes and zero data loss. The Percona XtraDB Cluster-based deployment provides a high grade of high availability (4-5 nines) and almost instant failover.



## See also

Percona Blog posts:

- [MySQL High Availability On-Premises: A Geographically Distributed Scenario](#)
- [Choosing MySQL High Availability Solutions](#)

# **Install and update**

# Install Percona Distribution for MySQL

We gather [Telemetry data on Percona XtraDB Cluster](#) and [Telemetry data on Percona Server for MySQL](#) in the Percona packages and Docker images.

We recommend installing Percona Distribution for MySQL from Percona repositories using the package manager of your operating system:

- `apt` - for Debian and Ubuntu Linux
- `yum` - for Red Hat Enterprise Linux and compatible Linux derivatives

Find the full list of supported platforms on the [Percona Software and Platform Lifecycle](#) page.



## Repository overview: Major and Minor repositories



Percona provides two repositories for every deployment variant of Percona Distribution for MySQL.

The *Major Release repository* includes the latest version packages (for example, `pdps-8.0` and `pdpxc-8.0`). Whenever a package is updated, the package manager of your operating system detects that and prompts you to update. As long as you update all Distribution packages at the same time, you can ensure that the packages you're using have been tested and verified by Percona. Installing Percona Distribution for MySQL from the Major Release Repository is the recommended method.

The *Minor Release repository* includes a particular minor release of the database and all of the packages that were tested and verified to work with that minor release (for example, `pdps-8.0.40` and `pdpxc-8.0.40`). You may choose to install Percona Distribution for MySQL from the Minor Release repository if you have decided to standardize on a particular release which has passed rigorous testing procedures and which has been verified to work with your applications. This allows you to deploy to a new host and ensure that you'll be using the same version of all the Distribution packages, even if newer releases exist in other repositories.

The disadvantage of using a Minor Release repository is that you are locked in this particular release. When potentially critical fixes are released in a later minor version of the database, you will not be prompted for an upgrade by the package manager of your operating system. You would need to change the configured repository in order to install the upgrade.

## Next steps

Select the download option to proceed with the installation.

[Install Percona Server-based variant →](#)

[Install Percona XtraDB Cluster-based variant →](#)

# Install Percona Server-based variant

We gather [Telemetry data on Percona Server for MySQL](#) in the Percona packages and Docker images.

## Prerequisites

To install Percona software, you need to configure the required repository. To simplify this process, use the `percona-release` repository management tool.

1. Install GnuPG and curl

```
$ sudo apt install gnupg2 curl
```

2. [Install percona-release](#). If you have it installed, [update percona-release](#) to the latest version.

## Procedure

### Important

Run the following commands as the root user or via `sudo`.

## Enable Percona repository

To enable the desired repository, we recommend to use the `setup` subcommand of `percona-release`.

```
$ sudo percona-release setup pdps-8.0
```

### Tip

To enable the minor version repository, use the following command:

```
$ sudo percona-release setup pdps-8.0.20
```

## Install Percona Distribution for MySQL packages

1. Install *Percona Server for MySQL*:

```
$ sudo apt install percona-server-server
```

2. Install the components. Use the commands below to install the required components:

Install Percona XtraBackup:

```
$ sudo apt install percona-xtrabackup-80
```

Install Percona Toolkit:

```
$ sudo apt install percona-toolkit
```

Install Orchestrator:

```
$ sudo apt install percona-orchestrator percona-orchestrator-cli percona-orchestrator-client
```



Install MySQL Shell:

```
$ sudo apt install percona-mysql-shell
```

Install ProxySQL:

```
$ sudo apt install proxysql2
```

Install MySQL Router:

```
$ sudo apt install percona-mysql-router
```

## On Red Hat Enterprise Linux and derivatives

### Platform specific notes

On CentOS 7, install the `epel-release` package. It includes the dependencies required to install Orchestrator. Use the following command:

```
$ sudo yum -y install epel-release
```

Run the following commands as the root user or via `sudo`.

## Enable Percona repository

To enable the desired repository, we recommend to use the `setup` subcommand of `percona-release`.

```
$ sudo percona-release setup pdps-8.0
```

### Tip

To enable the minor version repository, use the following command:

```
$ sudo percona-release setup pdps-8.0.20
```

## Install Percona Distribution for MySQL packages

1. Install *Percona Server for MySQL*:

```
$ sudo yum install percona-server-server
```

2. Install the components. Use the commands below to install the required components:

Install Percona XtraBackup

```
$ sudo yum install percona-xtrabackup-80
```

Install Orchestrator

```
$ sudo yum install percona-orchestrator percona-orchestrator-cli percona-orchestrator-client
```

Install Percona Toolkit

```
$ sudo yum install percona-toolkit
```

Install MySQL Shell:

```
$ sudo yum install percona-mysql-shell
```

Install ProxySQL:

```
$ sudo yum install proxysql2
```

Install MySQL Router:

```
$ sudo yum install percona-mysql-router
```

## Run Percona Distribution for MySQL

Percona Distribution for MySQL is not started automatically on Red Hat Enterprise Linux and CentOS after the installation is complete.

Start it manually using the following command:

```
$ sudo systemctl start mysql
```

Confirm that the service is running:

```
$ sudo systemctl status mysql
```

Stop the service:

```
$ sudo systemctl stop mysql
```

## Useful links

[Percona Software Download Instructions](#)

# Install Percona XtraDB Cluster-based variant

We gather [Telemetry data on Percona XtraDB Cluster](#) in the Percona packages and Docker images.

## Prerequisites

To install Percona software, you need to configure the required repository. To simplify this process, use the `percona-release` repository management tool.

1. Install GnuPG and curl

```
$ sudo apt install gnupg2 curl
```

2. [Install percona-release](#). If you have it installed, [update percona-release](#) to the latest version.

## Procedure

### Important

Run the following commands as the root user or via `sudo`.

## Enable Percona repository

To enable the desired repository, we recommend to use the `setup` subcommand of `percona-release`.

```
$ sudo percona-release setup pdps-8.0
```

### Tip

To enable the minor version repository, use the following command:

```
$ sudo percona-release setup pdpxc-8.0.20
```

## Install Percona Distribution for MySQL packages

1. Install *Percona XtraDB Cluster*:

```
$ sudo apt install percona-xtradb-cluster
```

2. Install HAProxy:

```
$ sudo apt install percona-haproxy
```

3. Install the components. Use the commands below to install the required components:

Install Percona XtraBackup:

```
$ sudo apt install percona-xtrabackup-80
```

Install Percona Toolkit:

```
$ sudo apt install percona-toolkit
```

## On Red Hat Enterprise Linux and derivatives

### Important

Run the following commands as the root user or via `sudo`.

## Enable Percona repository

To enable the desired repository, we recommend to use the `setup` subcommand of `percona-release`.

```
$ sudo percona-release setup pdps-8.0
```

### Tip

To enable the minor version repository, use the following command:

```
$ sudo percona-release setup pdpxc-8.0.20
```

## Install Percona Distribution for MySQL packages

1. Install *Percona XtraDB Cluster*:

```
$ sudo yum install percona-xtradb-cluster
```

2. Install HAProxy:

```
$ sudo yum install percona-haproxy
```

3. Install the components. Use the commands below to install the required components:

Install Percona XtraBackup:

```
$ sudo yum install percona-xtrabackup-80
```

Install Percona Toolkit:

```
$ sudo yum install percona-toolkit
```

## Run Percona Distribution for MySQL

Percona Distribution for MySQL is not started automatically on Red Hat Enterprise Linux and CentOS after the installation is complete.

Start it manually using the following command:

```
$ sudo systemctl start mysql
```

Confirm that the service is running:

```
$ sudo systemctl status mysql
```

Stop the service:

```
$ sudo systemctl stop mysql
```

## Useful links

[Percona Software Download Instructions](#)

# Percona Software Download Instructions

Do the following steps to select the software, the software version, and download the packages:

1. Go to [Percona Software Downloads](#).
2. Locate Percona Distribution for MySQL.
3. Select the required product in `Select Product`, for example, Percona Server for MySQL.
4. Select your distribution version in the `Select Product Version` dropdown, for example, `percona-distribution-mysql-ps-8.0.41`.
5. Select your platform in the `Select Platform` dropdown, for example, `Ubuntu 24.04 (Noble Numbat)`.

The `Package Download Options` may include both `AMD64` and `ARM64` packages. Select the correct CPU architecture for your system.

You can download specific packages one by one or download all packages using the `DOWNLOAD ALL PACKAGES` button. The easiest method is to download all packages.

The packages are downloaded to the local computer.



# Upgrade Percona Distribution for MySQL

Minor releases include bug fixes and feature enhancements. We recommend to have Percona Distribution for MySQL updated to the latest version.

Though minor releases don't change the behavior, even a minor upgrade is a risky process. We recommend to back up your data before upgrading.

## Preconditions

To upgrade Percona Distribution for MySQL, [install the `percona-release` repository management tool](#) or [update it](#) to the latest version.

## Procedure



### Important

Run the following commands as the root user or via `sudo`.

## Upgrade Percona Server-based variant

### 1. Enable Percona repository

The Major Release repository automatically includes new version packages of Percona Distribution for MySQL. If you installed Percona Distribution for MySQL from a Minor Release repository, enable the new version repository:

```
$ sudo percona-release setup pdps-XXX
```

where `XXX` is the required version.

Read more about major and Minor release repositories in [Repository overview](#).

### 2. Stop `mysql` service

```
$ sudo systemctl mysql stop
```

### 3. [Install new version packages](#) using the package manager of your operating system.

### 4. Restart `mysql` service:

```
$ sudo systemctl mysql start
```

## Upgrade Percona XtraDBCluster-based variant

Complete these steps sequentially on all nodes:

### 1. Enable Percona repository

The Major Release repository automatically includes new version packages of Percona Distribution for MySQL. If you installed Percona Distribution for MySQL from a Minor Release repository, enable the new version repository:

```
$ sudo percona-release setup pdpxc-XXX
```

where `XXX` is the required version.

Read more about major and Minor release repositories in [Repository overview](#).

### 2. Stop `mysql` service

```
$ sudo systemctl mysql stop
```

3. [Install new version packages](#) using the package manager of your operating system.
4. Back up the `grastate.dat` file
5. Restart `mysql` service

```
$ sudo systemctl mysql start
```



#### See also

[Upgrading Percona XtraDB Cluster](#)

To upgrade the components, refer to [Installing Percona Distribution for MySQL](#) for installation instructions relevant to your operating system.

# Downgrade Percona Distribution for MySQL

Following the [MySQL downgrade policy](#), the downgrade to a previous version of Percona Distribution of MySQL is not supported.

# **Solutions – high availability**

# High availability solution with Group Replication

Every architecture and deployment depends on customer requirements and application demands for high availability and the estimated level of usage. For example, using a high read or a high write application, or both with 99.999% availability.

This guide gives [architecture](#) and deployment recommendations along with a technical overview for a solution that provides a high level of high availability and assumes the usage of high read / write applications (20K or more queries per second). It also provides [step-by-step deployment guidelines](#).

This solution assumes the use of *Percona Server for MySQL* based deployment variant of Percona Distribution for MySQL with [Group Replication](#).

## High availability overview

How to measure availability and at what point does it become “high” availability?

Generally speaking, the measurement of availability is done by establishing a measurement time frame and dividing it by the time that it was available. This ratio will rarely be 1, which is equal to 100% availability. A solution is considered to be highly available if it is at least 99% or “two nines” available.

The following table provides downtime calculations per high availability level:

Availability, %	Downtime per year	Downtime per month	Downtime per week	Downtime per day
99% (“two nines”)	3.65 days	7.31 hours	1.68 hours	14.40 minutes
99.5% (“two nines five”)	1.83 days	3.65 hours	50.40 minutes	7.20 minutes
99.9% (“three nines”)	8.77 hours	43.83 minutes	10.08 minutes	1.44 minutes
99.95% (“three nines five”)	4.38 hours	21.92 minutes	5.04 minutes	43.20 seconds
99.99% (“four nines”)	52.60 minutes	4.38 minutes	1.01 minutes	8.64 seconds

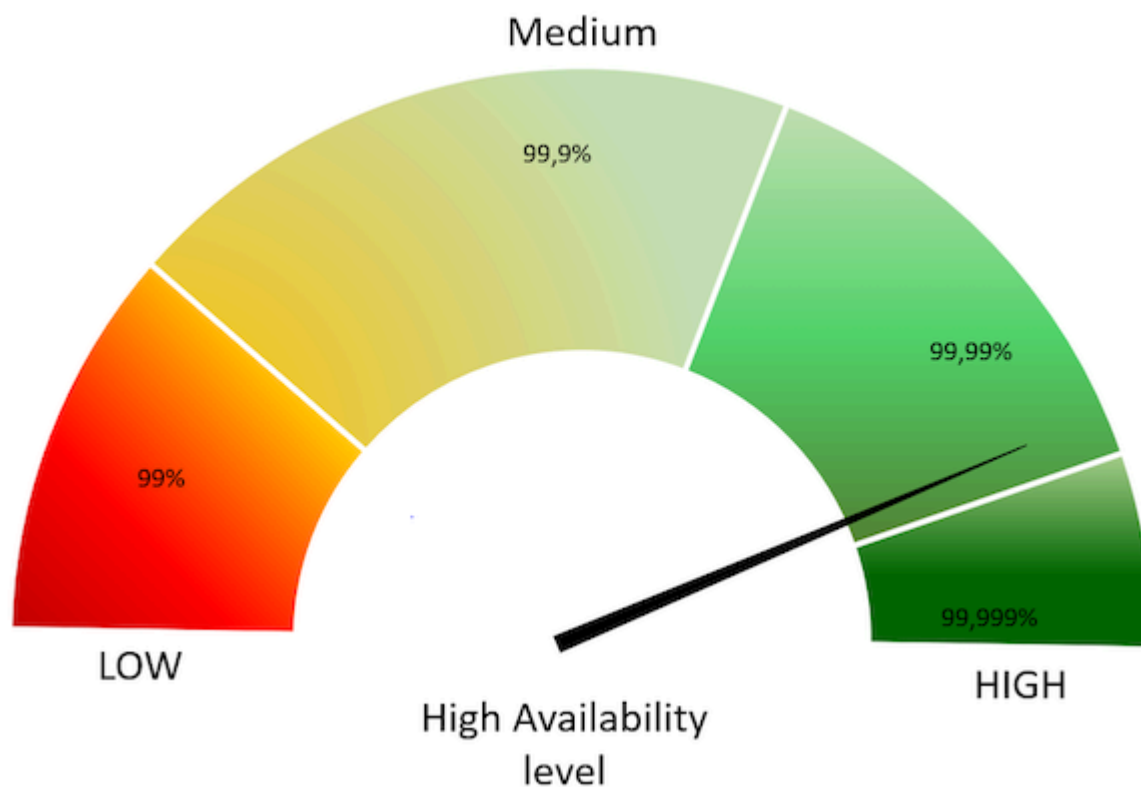
Availability, %	Downtime per year	Downtime per month	Downtime per week	Downtime per day
99.995% ("four nines five")	26.30 minutes	2.19 minutes	30.24 seconds	4.32 seconds
99.999% ("five nines")	5.26 minutes	26.30 seconds	6.05 seconds	864.00 milliseconds

## How is high availability achieved?

There are three key components to achieve high availability:

- **Infrastructure** - This is the physical or virtual hardware that database systems rely on to run. Without enough infrastructure (VM's, networking, etc.), there cannot be high availability. The easiest example is: `there is no way to make a single server highly available`.
- **Topology management** - This is the software management related specifically to the database and managing its ability to stay consistent in the event of a failure. Many clustering or synchronous replication solutions offer this capability out of the box. However, asynchronous replication is handled by additional software.
- **Connection management** - This is the software management related specifically to the networking and connectivity aspect of the database. Clustering solutions typically bundle with a connection manager. However, in asynchronous clusters, deploying a connection manager is mandatory for high availability.

This solution is based on a tightly coupled database cluster. It offers a high availability level of 99.995% when coupled with the Group Replication setting `group_replication_consistency=AFTER`.



## Failovers

A database failure or configuration change that requires a restart should not affect the stability of the database infrastructure, if it is properly planned and architected. Failovers are an integral part of a stability strategy and aligning the business requirements for availability and uptime with failover methodologies is critical.

The following are the three main types of failovers that can occur in database environments:

- **Planned failover.** This is a failover that has been scheduled in advance or occurs at a regular interval. There can be many reasons for planned failovers including patching, large data operations, retiring existing infrastructure, or simply to test the failover strategy.
- **Unplanned failover.** This is what occurs when a database has unexpectedly become unresponsive or experiences instability. An unplanned failover could also include emergency changes that do not fall under the planned failover cadence or scheduling parameters. Unplanned failovers are generally considered higher risk operations due to the high stress and high potential for data corruption or data fragmentation.
- **Regional or disaster recovery (DR) failover.** Unplanned failovers still work with the assumption that additional database infrastructure is immediately available and in a usable state. However, in a regional or DR failover, it is assumed that there is a large scale infrastructure outage which requires the business to move its operations away from its current availability zone.



# Maintenance windows

## Major vs Minor maintenance

Although it may not be obvious at first, not all maintenance activities are created equal and do not have the same dependencies. It is good to separate maintenance that demands downtime or failover from maintenance that can be done without impacting those important stability metrics. When defining these maintenance dependencies, there can be a change in the actual maintenance process that allows for a different cadence.

## Maintenance without service interruption

It is possible to cover both major and minor maintenance without service interruption with rolling restart and using proper version upgrade.

## Uptime

When referring to database stability, uptime is likely the largest indicator of stability and often is the most obvious symptom of an unstable database environment. Uptime is composed of three key components and, contrary to common perception, is based on what happens when the database software cannot take incoming requests rather than maintain the ability to take requests with errors.

The uptime components are:

- **Recovery Time Objective (RTO)**

RTO can be characterized by a simple question “How long can the business sustain a database outage?” Once the business is aligned with a minimum viable recovery time objective, it is much more straightforward to plan and invest in the infrastructure required to meet that requirement. It is important to acknowledge that while everyone desires 100% uptime, there need to be realistic expectations that align with the business needs and not a technical desire.

- **Recovery Point Objective (RPO)**

There is a big distinction between the Recovery Point and the Recovery Time for a database infrastructure. The database can be available, but not to the exact state that it was when it became unavailable. That is where Recovery Point comes in. The question to ask here is “How much data can the business lose during a database outage?” All businesses have their own requirements here yet it is always the goal to never sustain any data loss. But this is framed in the worst case scenario, how much data could be lost and the business maintains the ability to continue.

- **Disaster recovery**

RTO and RPO are great for unplanned outages or small scale hiccups to the infrastructure. Disaster recovery is a major large scale outage not strictly for the database infrastructure. How capable is the business of restarting operations with the assumption that all resources are completely unavailable in the main availability zone? The assumption here is that there is no viable restoration point or time that aligns with the business requirements. While each disaster recovery scenario is unique based on available infrastructure, backup strategy and technology stack, there are some common threads for any scenario.

The described solution **helps improve uptime**. It will help you to significantly reduce both RPO and RTO. Given the tightly coupled cluster solution approach, the failure of a single node will not result in service interruption.

Increasing the number of nodes will also improve the cluster resilience by the formula:

$$F = (N - 1) / 2$$

where:

- **F** is the number of admissible failures
- **N** is the number of nodes in the cluster.

## Example

- In a cluster of 5 nodes,  $F = (5 - 1) / 2 = 2$ . The cluster can support up to 2 failures.
- In a cluster of 4 nodes,  $F = (4 - 1) / 2 = 1$ . The cluster can support up to 1 failure.

This solution also allows for a more restrictive backup policy, dedicating a node to the backup cycle, which will help in keeping RPO low.

As previously mentioned, disaster recovery is not covered by default by this solution. It will require an additional replication setup and controller.



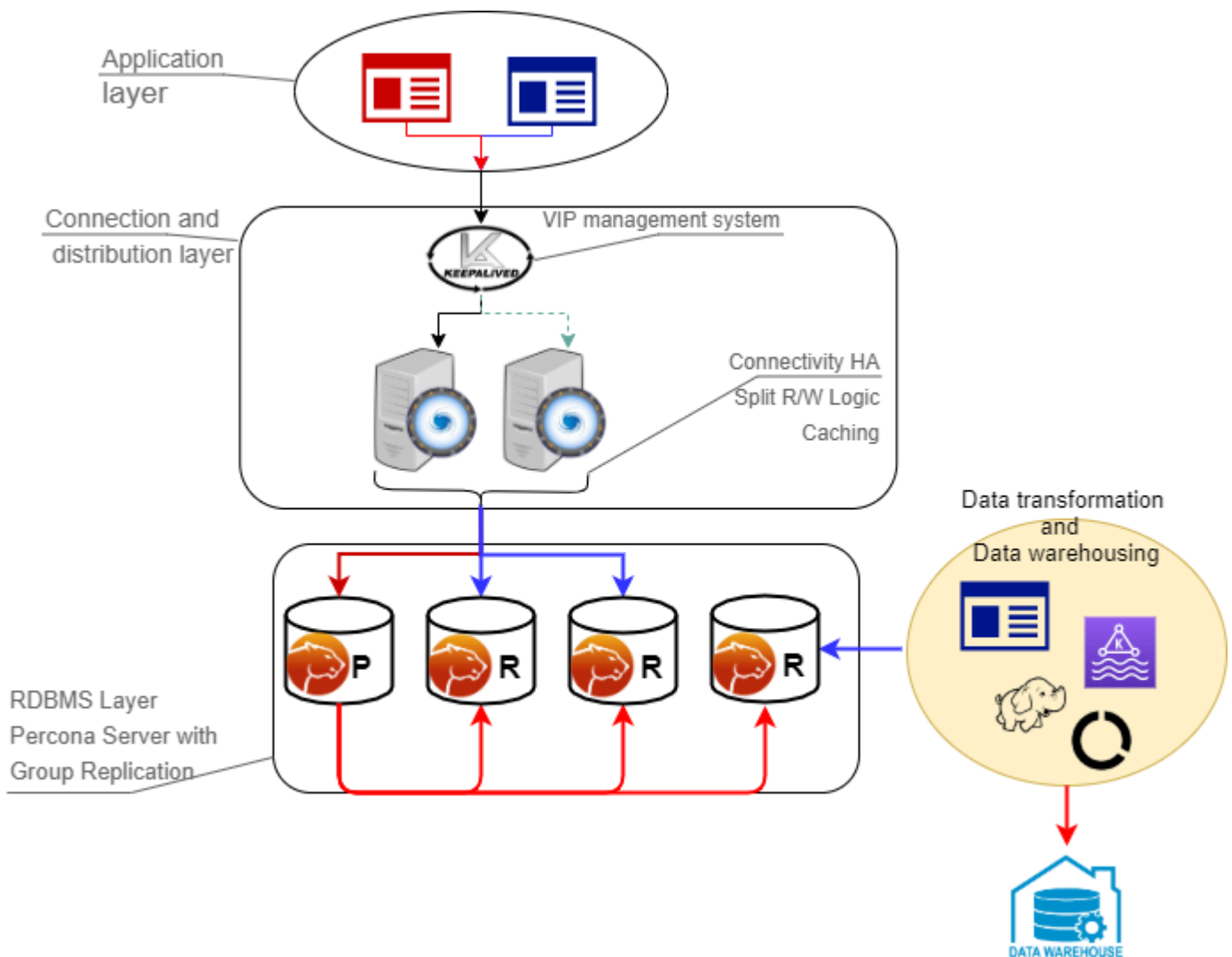
**Based on the material from Percona Database Performance Blog**

This document is based on the blog post [Percona Distribution for MySQL: High Availability with Group Replication Solution](#) by Marco Tusa

# Architecture and components

The following is the architecture layout for *Percona Server for MySQL* based deployment variant of Percona Distribution for MySQL with [Group Replication](#).

## Architecture layout



## Components

The architecture is composed of two main layers:

- [Connection and distribution layer](#)
- [Relational Database Management System \(RDBMS\) layer](#)

## Connection and distribution layer

The connection and distribution layer consists of the following:

- **Application to proxy redirection mechanism.** This mechanism can be anything from a Virtual IP managed by Keepalived local service to a DNS resolution service like Amazon Route 53. The mechanism's function is to redirect the traffic to the active Proxy node.
- **Proxy connection distribution.** The distribution consists of two or more nodes and its role is to redirect the traffic to the active nodes of the Group Replication cluster. In cases like ProxySQL where the proxy is a level 7 proxy and can perform a read / write split, this layer is also in charge of redirecting writes to the Primary node and reads to the replicas, and of high availability to prevent a single point of failure.

## RDBMS layer

The data layer consists of the following:

- **Primary (or source) node** serving write requests. This is the node that accepts writes and DDL modifications. Data will be processed following the ACID (atomicity, consistency, isolation, durability) model and replicated to all other nodes.
- **Replica nodes** serving read requests. Some replica nodes can be elected Primary in case of the Primary node's failure. A replica node should be able to leave and join back to a healthy cluster without impacting the service.
- **Replication mechanism** distributing changes across nodes. In this solution, it is done with Group Replication. Group Replication is a tightly coupled solution, which means that the database cluster is based on a Datacentric approach (single state of the data, distributed commit). In this case, the data is consistent in time across nodes though this type of replication requires a high performant link. Given that, the main Group Replication mechanism does not implicitly support Disaster Recovery (DR) and geographic distribution is not permitted.

The node characteristics such as CPU/RAM/Storage are not relevant to the solution design. They must reflect the estimated workload that the solution will have to cover, and this is a case by case identification.

However, it is important that all nodes that are part of the cluster must have the same characteristics. Otherwise, the cluster is imbalanced and services will be affected.

As a generic indication we recommend using nodes with at least 8 cores and 16GB RAM when in production.

# Measurement and monitoring

To ensure that database infrastructure is performing as intended or at its best, specific metrics need to be measured and alerts are to be raised when some of these metrics are not in line with expectations. A periodic review of these measurements is also encouraged to promote stability and understand potential risks associated with the database infrastructure.

The following are the 3 aspects of database performance measurement and monitoring:

- **Measurement** - To understand how a database infrastructure is performing, multiple aspects of the infrastructure need to be measured. With measurement it's important to understand the impact of the sample sizes, sample timing, and sample types.
- **Metrics** - Metrics refer to the actual parts of the database infrastructure being measured. When we discuss metrics, more isn't always better as it could introduce unintentional noise or make troubleshooting overly burdensome.
- **Alerting** - When one or many metrics of the database infrastructure is not within a normal or acceptable range, an alert should be generated so that the team responsible for the appropriate portion of the database infrastructure can investigate and remedy it.

Monitoring and measurement for this solution are covered by [Percona Monitoring and Management](#). It has a specific dashboard to monitor the Group Replication state and cluster status as a whole. For more information, read [Percona Monitoring and Management Documentation](#).

# Deploying high availability solution with Group Replication

This document provides step-by-step instructions on how to deploy high availability solution with Group Replication.

## Preconditions

We will use the following elements:

- 1 Virtual IP for ProxySQL failover - 192.168.4.194
- 2 ProxySQL nodes
  - Proxy1 192.168.4.191
  - Proxy2 192.168.4.192
- 4 MySQL nodes in Single Primary mode
  - Gr1 192.168.4.81 - Initial Primary
  - Gr2 192.168.4.82 - Replica / failover
  - Gr3 192.168.4.83 - Replica / failover
  - Gr4 192.168.4.84 - Replica / Backup
- All of the following ports must be open if a firewall is in place or any other restriction like AppArmor or SELinux.
  - ProxySQL:
    - 6033
    - 6032
    - 3306
  - MySQL - Group Replication:
    - 3306
    - 33060
    - 33061

## Nodes configuration

## Preparation

1. Install Percona Server-based variant of Percona Distribution for MySQL on each MySQL node (Gr1-Gr4).
2. Make sure that all the nodes use the same time-zone and time

```
$ date
Tue Aug 18 08:22:12 EDT 2020
```

3. Also check that `ntpd` service is present and enabled
4. Make sure that each node resolves the other nodes by name

```
for i in 1 2 3 4 ; do ping -c 1 gr$i > /dev/null;echo $?; done
```

If nodes aren't able to resolve, add the entries in the `/etc/hosts` file.

5. After instances are up and running, check *Percona Server for MySQL* version on each node:

```
mysql>\s
-----
/opt/mysql_templates/PS-8P/bin/mysql  Ver 8.0.20-11 for Linux on x86_64
(Percona Server (GPL), Release 11, Revision 159f0eb)
```

## Step 1 Create an administration user

1. Create a user for administration. We will use the user `dba` in our setup:

```
CREATE user dba@localhost identified by 'dbapw';
CREATE user dba@'192.168.%' identified by 'dbapw';

GRANT ALL on *.* to dba@localhost with grant option;
GRANT ALL on *.* to dba@'192.168.%' with grant option;
```

Log out from the client as the root user and log in as the `dba` user.

2. Make sure to have a good and unique `SERVER_ID` value:

```
mysql> show global variables like 'server_id';
+-----+-----+
| Variable_name | Value |
+-----+-----+
| server_id     | 1     |
+-----+-----+
1 row in set (0.01 sec)
```

The `server_id` value must be unique on each node

## Step 2. Add Group Replication settings

1. Stop all the nodes

```
$ service mysql stop
```

2. In the `my.cnf` configuration file, add the following:



```
#####
#Replication + binlog settings
#####
auto-increment-increment          =1
auto-increment-offset             =1

log-bin                           =<path_to_logs>/binlog
log-bin-index                     =binlog.index
binlog-checksum                   =NONE
binlog-format                     =ROW
binlog-row-image                  =FULL
log-slave-updates
=1
binlog-transaction-dependency-tracking    =WRITESET_SESSION

enforce-gtid-consistency          =TRUE
gtid-mode                        =ON

master-info-file                  =master.info
master-info-repository           =TABLE
relay_log_info_repository        =TABLE
relay-log                        =<path_to_logs>/relay

sync-binlog                      =1

### SLAVE SECTION
skip-slave-start
slave-parallel-type              = LOGICAL_CLOCK
slave-parallel-workers           = 4
slave-preserve-commit-order      = 1

#####
#Group Replication
#####
plugin_load_add                  ='group_replication.so'
plugin-load-add                  ='mysql_clone.so'
group_replication_group_name     ="aaaaaaaa-aaaa-aaaa-aaaa-aaaaaaaaaaaaa"  #
<-- Not good. Use something

                                that will help you to identify the GR
transactions and from where they come from IE "dc1euz1-aaaa-aaaa-aaaa-
aaaaaaaaaaaaa"
group_replication_start_on_boot  =off
group_replication_local_address  =
"192.168.4.81/2/3/4:33061" <---- CHANGE THIS TO MATCH EACH NODE LOCAL IP
group_replication_group_seeds    =
"192.168.4.81:33061,192.168.4.82:33061,192.168.4.83:33061,192.168.4.84:33061"
group_replication_bootstrap_group = off
transaction-write-set-extraction = XXHASH64
```

3. Restart all nodes:

```
$ service mysql start
```

4. Connect to the nodes

### Step 3. Create a replication user

1. On every node, create a user for replication

```
SET SQL_LOG_BIN=0;
CREATE USER replica@'192.168.4.%' IDENTIFIED BY 'replicapw'; #<--- Please
note the filter by IP is more restrictive
GRANT REPLICATION SLAVE ON *.* TO replica@'192.168.4.%';
FLUSH PRIVILEGES;
SET SQL_LOG_BIN=1;
```

2. Link the nodes with the replication channel.

```
CHANGE MASTER TO MASTER_USER='replica', MASTER_PASSWORD='replicapw' FOR
CHANNEL 'group_replication_recovery';
```

Run this command on all nodes.

3. Check the current status:

```
(dba@node1) [(none)]>\u performance_schema
(dba@node1) [performance_schema]>show tables like '%repl%';
+-----+
| Tables_in_performance_schema (%repl%) |
+-----+
| replication_applier_configuration      |
| replication_applier_filters            |
| replication_applier_global_filters     |
| replication_applier_status             |
| replication_applier_status_by_coordinator |
| replication_applier_status_by_worker   |
| replication_connection_configuration    |
| replication_connection_status          |
| replication_group_member_stats         |
| replication_group_members              | <-----+
+-----+

(dba@node1) [performance_schema]>select * from replication_group_members\G
CHANNEL_NAME: group_replication_applier
  MEMBER_ID:
  MEMBER_HOST:
  MEMBER_PORT:
  MEMBER_STATE:
  MEMBER_ROLE: OFFLINE
  MEMBER_VERSION:
1 row in set (0.00 sec)
```

At this stage, you should be able to start the first (Primary) cluster node.

#### 4. Start the Primary node (Gr1) and enable Group Replication:

```
(dba@node1)[none]> SET GLOBAL group_replication_bootstrap_group=ON;
(dba@node1)[none]> START GROUP_REPLICATION;
(dba@node1)[none]> SET GLOBAL group_replication_bootstrap_group=OFF;
```

#### 5. Check if the node registered correctly:

```
(dba@node1) [none]>select * from
performance_schema.replication_group_members\G
  CHANNEL_NAME: group_replication_applier
  MEMBER_ID: 90a353b8-e6dc-11ea-98fa-08002734ed50
  MEMBER_HOST: gr1
  MEMBER_PORT: 3306
  MEMBER_STATE: ONLINE
  MEMBER_ROLE: PRIMARY
  MEMBER_VERSION: 8.0.20
```

6. Once the Primary node is running, connect to the secondary node (Gr2 node) and enable Group Replication:

```
(dba@node2) [none]>START GROUP_REPLICATION;  
Query OK, 0 rows affected (4.60 sec)
```

7. Check if the secondary node registered correctly:

```
(dba@node2) [performance_schema]>select * from replication_group_members\G  
***** 1. row *****  
CHANNEL_NAME: group_replication_applier  
  MEMBER_ID: 58ffd118-e6dc-11ea-8af8-08002734ed50  
  MEMBER_HOST: gr2  
  MEMBER_PORT: 3306  
  MEMBER_STATE: ONLINE  
  MEMBER_ROLE: SECONDARY  
MEMBER_VERSION: 8.0.20  
***** 2. row *****  
CHANNEL_NAME: group_replication_applier  
  MEMBER_ID: 90a353b8-e6dc-11ea-98fa-08002734ed50  
  MEMBER_HOST: gr1  
  MEMBER_PORT: 3306  
  MEMBER_STATE: ONLINE  
  MEMBER_ROLE: PRIMARY  
MEMBER_VERSION: 8.0.20
```

8. Test the replication:

- On the Primary node, run the following command:

```
(dba@node1) [performance_schema]>create schema test;  
Query OK, 1 row affected (0.76 sec)  
  
(dba@node1) [performance_schema]>\u test  
Database changed  
  
(dba@node1) [test]>create table test1 (`id` int auto_increment primary key);  
Query OK, 0 rows affected (0.32 sec)  
  
(dba@node1) [test]>insert into test1 values(null);  
Query OK, 1 row affected (0.34 sec)
```

- On the secondary node:

```
(dba@node2) [performance_schema]>use \test
Database changed
(dba@node2) [test]>select * from test1;
+----+
| id |
+----+
|  1 |
+----+
1 row in set (0.00 sec)
```

## 9. Start Group Replication on the remaining nodes

```
(dba@node3) [performance_schema]>START GROUP_REPLICATION;
(dba@node4) [performance_schema]>START GROUP_REPLICATION;
```

# Proxy setup

## Step 1. Installation

1. [Install ProxySQL](#). In our example, we install ProxySQL on Proxy1 192.168.4.191 and Proxy2 192.168.4.192 nodes.
2. Create the monitoring user on MySQL Group Replication nodes:

```
create user monitor@'192.168.4.%' identified by 'monitor';
grant usage on *.* to 'monitor'@'192.168.4.%;
grant select on sys.* to 'monitor'@'192.168.4.%;
```

3. Define basic variables:

```

update global_variables set Variable_Value='admin:admin;cluster1:clusterpass'
where Variable_name='admin-admin_credentials';
update global_variables set variable_value='cluster1' where
variable_name='admin-cluster_username';
update global_variables set variable_value='clusterpass' where
variable_name='admin-cluster_password';
update global_variables set Variable_Value=0 where Variable_name='mysql-
hostgroup_manager_verbose';
update global_variables set Variable_Value='true' where Variable_name='mysql-
query_digests_normalize_digest_text';
update global_variables set Variable_Value='8.0.20' where
Variable_name='mysql-server_version';
update global_variables set Variable_Value='utf8' where Variable_name='mysql-
default_charset';
update global_variables set Variable_Value=300 where Variable_name='mysql-
tcp_keepalive_time';
update global_variables set Variable_Value='true' where Variable_name='mysql-
use_tcp_keepalive';
update global_variables set Variable_Value='true' where Variable_name='mysql-
verbose_query_error';
update global_variables set Variable_Value='true' where Variable_name='mysql-
show_processlist_extended';
update global_variables set Variable_Value=50000 where Variable_name='mysql-
max_stmts_cache';
update global_variables set Variable_Value='false' where
Variable_name='admin-web_enabled';
update global_variables set Variable_Value='0' where Variable_name='mysql-
set_query_lock_on_hostgroup';

load admin variables to run;save admin variables to disk;
load mysql variables to run;save mysql variables to disk;

```



#### Note

The user name and password need to reflect your standards. The ones used above are just an example.

#### 4. Set up the nodes as a cluster:

```

INSERT INTO proxysql_servers (hostname,port,weight,comment)
VALUES('192.168.4.191',6032,100,'PRIMARY');
INSERT INTO proxysql_servers (hostname,port,weight,comment)
VALUES('192.168.4.192',6032,100,'SECONDARY');
load proxysql servers to run;save proxysql servers to disk;

```

## Step 2. Define users, servers and query rules for read / write split

1. Create one or more valid users. Define these user(s). For example, if you have a user named `app_gr` with the password `test`, and that has access to your Group Replication cluster, the command to define the user is the following:

```
insert into mysql_users
(username,password,active,default_hostgroup,default_schema,transaction_persist
ent,comment) values ('app_gr','test',1,400,'mysql',1,'application test user
GR');
LOAD MYSQL USERS TO RUNTIME;SAVE MYSQL USERS TO DISK;
```

2. Define servers:

```
INSERT INTO mysql_servers
(hostname,hostgroup_id,port,weight,max_connections,comment) VALUES
('192.168.4.81',400,3306,10000,2000,'GR1');
INSERT INTO mysql_servers
(hostname,hostgroup_id,port,weight,max_connections,comment) VALUES
('192.168.4.81',401,3306,100,2000,'GR1');
INSERT INTO mysql_servers
(hostname,hostgroup_id,port,weight,max_connections,comment) VALUES
('192.168.4.82',401,3306,10000,2000,'GR2');
INSERT INTO mysql_servers
(hostname,hostgroup_id,port,weight,max_connections,comment) VALUES
('192.168.4.83',401,3306,10000,2000,'GR2');
INSERT INTO mysql_servers
(hostname,hostgroup_id,port,weight,max_connections,comment) VALUES
('192.168.4.84',401,3306,1,2000,'GR2');
LOAD MYSQL SERVERS TO RUNTIME; SAVE MYSQL SERVERS TO DISK;
```

3. Define query rules to get read / write split:

```
INSERT INTO mysql_query_rules
(rule_id,proxy_port,username,destination_hostgroup,active,retries,match_digest
,apply) values(4040,6033,'app_gr',400,1,3,'^SELECT.*FOR UPDATE',1);
INSERT INTO mysql_query_rules
(rule_id,proxy_port,username,destination_hostgroup,active,retries,match_digest
,multiplex,apply) values(4042,6033,'app_gr',401,1,3,'^SELECT.*$',1,1);
LOAD MYSQL QUERY RULES TO RUN;SAVE MYSQL QUERY RULES TO DISK;
```

### Step 3. Create a view in SYS schema

Once all the configuration is ready, we need to have a special view in the SYS schema in Percona server nodes. Find the view working for the server version 8 and above [here](#).

Run that sql on the **Primary** node of the Group Replication cluster.

## Step 4. Activate support for Group Replication in ProxySQL

To activate the native support for Group Replication in ProxySQL, we will use the following group definition:

```
Writer HG-> 400
Reader HG-> 401
BackupW HG-> 402
Offline HG-> 9401
```

```
INSERT INTO mysql_group_replication_hostgroups
(writer_hostgroup,backup_writer_hostgroup,reader_hostgroup,
offline_hostgroup,active,max_writers,writer_is_also_reader,max_transactions_behin
d)
values (400,402,401,9401,1,1,1,100);
LOAD MYSQL SERVERS TO RUNTIME; SAVE MYSQL SERVERS TO DISK;
```

### Comments about parameters

To obtain the most reliable results, we recommend setting the number of writers always to 1, and `writer_is_also_reader` to 1 as well.

```
max_writers: 1
writer_is_also_reader: 1
```

The `max_transactions_behind` is a subjective parameter that you should calculate on the basis of your needs. If, for instance, you cannot have a stale read, it will be safe to set this value to a low number (i.e. 50) and to set in all Group Replication nodes:

```
set global group_replication_consistency=AFTER;
```

If instead, you have no issue or strict requirements about some stale read, you can relax the parameter and ignore the `group_replication_consistency` setting. Our recommended setting is `group_replication_consistency=AFTER` and `max_transactions_behind: 100`.



#### See also

ProxySQL Documentation: [mysql\\_group\\_replication\\_hostgroups](#)



## Step 5. Enable high availability for ProxySQL

`keepalived` will be used to enable High Availability for ProxySQL.

1. Install `keepalived` on each ProxySQL node using the package manager of your operating system:

### on Debian/Ubuntu

```
$ sudo apt install -y keepalived
```

### On RHEL/derivatives

```
$ sudo yum install -y keepalived
```

2. Modify the `/etc/keepalived/keepalived.conf` file accordingly to your setup. In our case:

- Proxy1 192.168.4.0/24 dev enp0s9 proto kernel scope link src 192.168.4.191
- Proxy2 192.168.4.0/24 dev enp0s9 proto kernel scope link src 192.168.4.192
- VIP 192.168.4.194

Let's say Proxy1 is the primary node while Proxy2 is the secondary node.

Given that, the config file looks as follows:

```

global_defs {
    # Keepalived process identifier
    router_id proxy_HA
}
# Script used to check if Proxy is running
vrrp_script check_proxy {
    script "killall -0 proxysql"
    interval 2
    weight 2
}
# Virtual interface
# The priority specifies the order in which the assigned interface to take
over in a failover
vrrp_instance VI_01 {
    state MASTER
    interface enp0s9
    virtual_router_id 51
    priority 100 <----- This needs to be different for each ProxySQL node, like
100/99

    # The virtual ip address shared between the two load balancers
    virtual_ipaddress {
        192.168.4.194 dev enp0s9
    }
    track_script {
        check_proxy
    }
}

```

3. Start the `keepalived` service. From now on, the VIP will be associated with the Proxy1 unless the service is down.

## Disaster recovery implementation

The implementation of a DR (Disaster Recovery) site will follow the same direction provided for the main site. There are only some generic rules to follow:

- A DR site should be located in a different geographic location than the main site (several hundred kilometers/miles away).
- The connection link between the main site and the DR site can only be established using *asynchronous replication* (standard MySQL [replication setup](#)).

## Monitoring

## Using Percona Management and Monitoring (PMM)

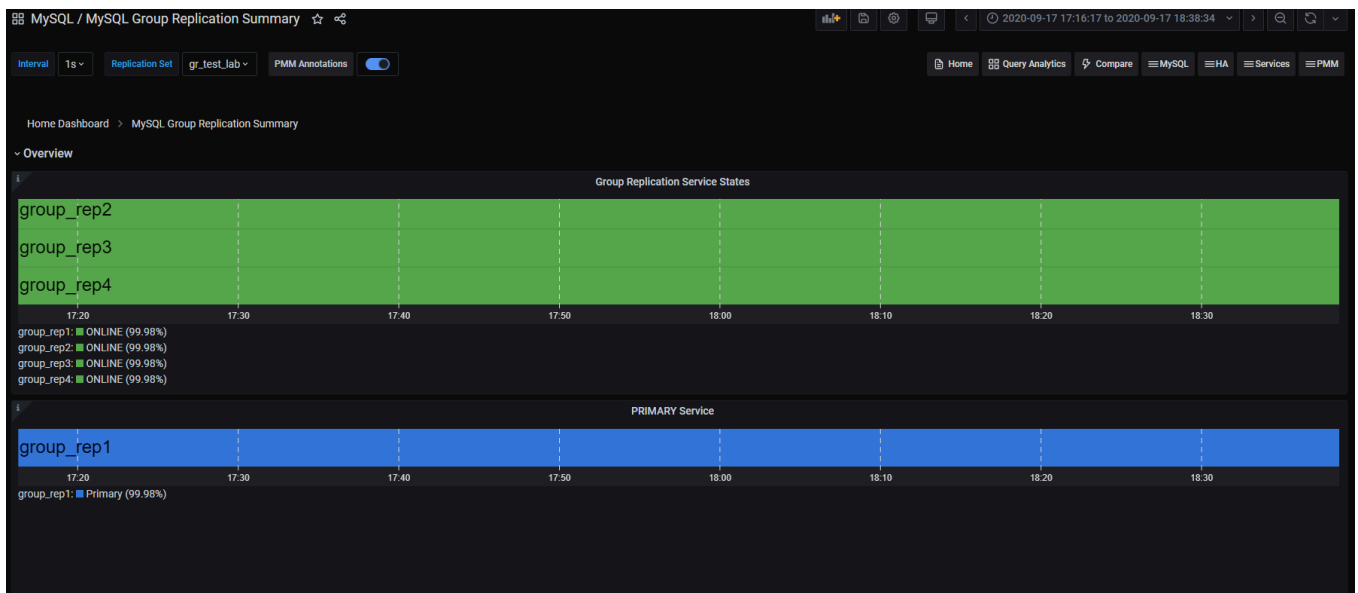
1. Use [this quickstart](#) to install Percona Monitoring and Management (PMM).
2. Specify the `replication_set` flag when registering the *Percona Server for MySQL* node or the MySQL node in PMM:

```
pmm-admin add mysql --username=pmm --password=pmm --query-source=perfschema --  
replication-set=gr_test_lab group_rep4 127.0.0.1:3306
```

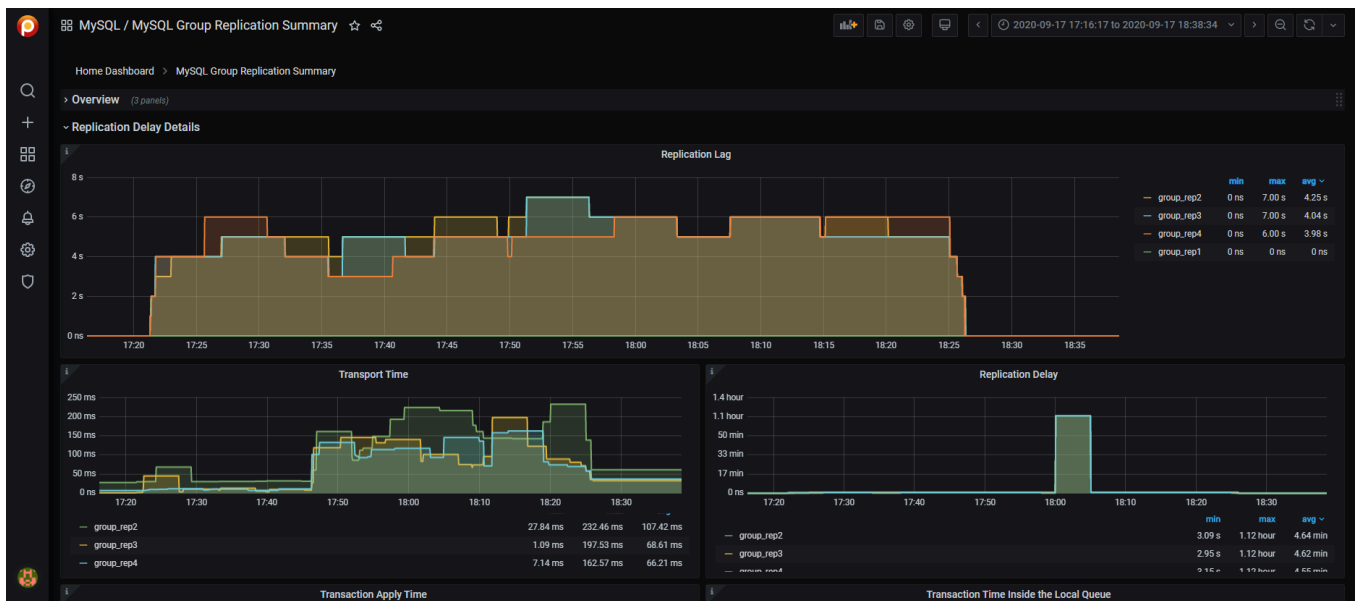
Then you can use the Group Replication Dashboard and monitor your cluster with a lot of details.

The dashboard sections are the following:

### 1. Overview:



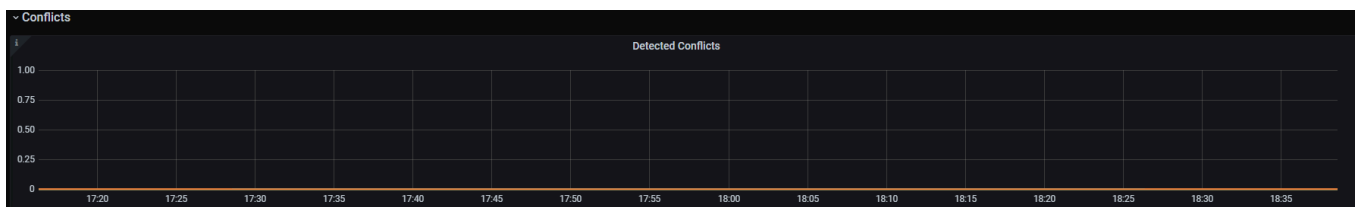
### 2. Replication delay details



### 3. Transactions



### 4. Conflicts



## Using command line

From the command line, you need to manually query the tables in Performance schema:

```

+-----+
| replication_applier_configuration |
| replication_applier_filters      |
| replication_applier_global_filters |
| replication_applier_status       |
| replication_applier_status_by_coordinator |
| replication_applier_status_by_worker |
| replication_connection_configuration |
| replication_connection_status     |
| replication_group_member_stats    |
| replication_group_members         |
+-----+

```

For example, use this command to get the lag in number of transactions on a node:

```

select @last_exec:=SUBSTRING_INDEX(SUBSTRING_INDEX(
@@global.GTID_EXECUTED,':',-1),'-',-1) last_executed;select
@last_rec:=SUBSTRING_INDEX(SUBSTRING_INDEX(Received_transaction_set,':',-1),'-',-1) last_received FROM performance_schema.replication_connection_status WHERE
Channel_name = 'group_replication_applier'; select (@last_rec - @last_exec) as
real_lag;
+-----+
| last_executed |
+-----+
| 125624        |
+-----+
1 row in set, 1 warning (0.03 sec)

+-----+
| last_received |
+-----+
| 125624        |
+-----+
1 row in set, 1 warning (0.00 sec)

+-----+
| real_lag      |
+-----+
| 0             |
+-----+
1 row in set (0.00 sec)

```

You can use a more composite query to get information about each applier:

```

SELECT
  conn_status.channel_name as channel_name,
  conn_status.service_state as IO_thread,
  applier_status.service_state as SQL_thread,
  conn_status.LAST_QUEUED_TRANSACTION as last_queued_transaction,
  applier_status.LAST_APPLIED_TRANSACTION as last_applied_transaction,
  LAST_APPLIED_TRANSACTION_END_APPLY_TIMESTAMP -
      LAST_APPLIED_TRANSACTION_ORIGINAL_COMMIT_TIMESTAMP
'rep delay (sec)',
  LAST_QUEUED_TRANSACTION_START_QUEUE_TIMESTAMP -
      LAST_QUEUED_TRANSACTION_ORIGINAL_COMMIT_TIMESTAMP
'transport time',
  LAST_QUEUED_TRANSACTION_END_QUEUE_TIMESTAMP -
      LAST_QUEUED_TRANSACTION_START_QUEUE_TIMESTAMP 'time
RL',
  LAST_APPLIED_TRANSACTION_END_APPLY_TIMESTAMP -
      LAST_APPLIED_TRANSACTION_START_APPLY_TIMESTAMP 'apply
time',
  if(GTID_SUBTRACT(LAST_QUEUED_TRANSACTION, LAST_APPLIED_TRANSACTION) = "", "0" ,
abs(time_to_sec(if(time_to_sec(APPLYING_TRANSACTION_ORIGINAL_COMMIT_TIMESTAMP)=0,
0,timediff(APPLYING_TRANSACTION_ORIGINAL_COMMIT_TIMESTAMP,now()))))) `lag_in_sec`
FROM
  performance_schema.replication_connection_status AS conn_status
JOIN performance_schema.replication_applier_status_by_worker AS applier_status
  ON applier_status.channel_name = conn_status.channel_name
ORDER BY lag_in_sec, lag_in_sec desc\G

```

Output:

```

***** 1. row *****
channel_name: group_replication_applier
IO_thread: ON
SQL_thread: ON
last_queued_transaction: aaaaaaaa-aaaa-aaaa-aaaa-aaaaaaaaaaaa:125624
last_applied_transaction: aaaaaaaa-aaaa-aaaa-aaaa-aaaaaaaaaaaa:125621
rep delay (sec): 3.153038
transport time: 0.061327
time RL: 0.001005
apply time: 0.388680
lag_in_sec: 0

```

 Based on the material from Percona Database Performance Blog

This document is based on the blog post [Percona Distribution for MySQL: High Availability with Group Replication Solution](#) by Marco Tusa

# **Replication manager for Percona XtraDB Cluster**

# Replication manager for Percona XtraDB Cluster

The feature is a [tech preview](#). Before using this feature in production, we recommend that you test restoring production from physical backups in your environment, and also use the alternative backup method for redundancy.

The replication manager script helps manage [multi-source replication](#) between multiple Percona XtraDB Cluster clusters. This tool has a failover mechanism and can automatically perform a failover due to source or replica node failures, service degradation, or maintenance requirements.

The replication manager script monitors the active source-replica replication channel. If the source or replica node fails, the script re-establishes the replication channel using alternative source or replica cluster nodes.

## Example

For example, we deploy multi-source replication links between three data centers: DC1, DC2, and DC3. In each data center, there are three Percona XtraDB Cluster nodes form distinct Percona XtraDB Cluster clusters. The data centers contain the following nodes:

DC1	DC2	DC3
DC1-1	DC2-1	DC3-1
DC1-2	DC2-2	DC3-2
DC1-3	DC2-3	DC3-3

The topology is the following:

```
DC2 <=> DC1 <=> DC3
```

All of the nodes are sources and replicas. DC1 is a replica of DC2 and DC3. DC2 and DC3 are replicas of DC1.



clusterSlave	clusterMaster
DC1	DC2
DC1	DC3
DC2	DC1
DC3	DC1

The example of the minimal MySQL configuration file for DC1 that is common for all three DC1 nodes:

```
[mysqld]
# General galera reqs
default_storage_engine=InnoDB
innodb_autoinc_lock_mode=2

# Replication settings
binlog_format=ROW
server-id=1
log-bin=mysql-bin
log_replica_updates
expire_logs_days=7
gtid_mode = ON
enforce_gtid_consistency=ON
skip-replica-start

# Galera configuration
wsrep_provider=/usr/lib/galera3/libgalera_smm.so
wsrep_cluster_address=gcomm://10.0.4.160,10.0.4.162,10.0.4.163
wsrep_replica_threads= 2
wsrep_log_conflicts
wsrep_cluster_name=DC1
pxc_strict_mode=ENFORCING
wsrep_sst_method=xtrabackup-v2
wsrep_sst_auth="root:root"
```

All nodes have the same `server-id` value.

## Configuration steps

1. Bootstrap the cluster on DC1-1 node by running the following commands as root or using sudo:

```
[root@DC1-1 ~]# /etc/init.d/mysql stop
[root@DC1-1 ~]# /etc/init.d/mysql bootstrap-pxc
```

2. On DC1-2 node, stop MySQL, delete the content of the datadir to force the SST, and start MySQL. Run the following commands as root or using sudo:

```
[root@DC1-2 ~]# /etc/init.d/mysql stop
[root@DC1-2 ~]# rm -rf /var/lib/mysql/*
[root@DC1-2 ~]# /etc/init.d/mysql start
```

3. Once the SST of DC1-2 node is completed, proceed on DC1-3. Run the following commands as root or using sudo:

```
[root@DC1-3 ~]# /etc/init.d/mysql stop
[root@DC1-3 ~]# rm -rf /var/lib/mysql/*
[root@DC1-3 ~]# /etc/init.d/mysql start
```

4. The DC1 cluster uses a single [GTID](#) sequence. To make sure `GTID_PURGED` is the same, run the following commands on DC1-1, DC1-2, and DC1-3 nodes:

```
mysql> flush logs;
mysql> purge binary logs to 'mysql-bin.000003';
```

`mysql-bin.000003` is the last file returned when you run the following command:

```
mysql> `SHOW BINARY LOGS`
```

5. Adjust the aforementioned steps to set up the DC2 and DC3 clusters accordingly.
6. Add privileges for replication between all nodes only for DC1:

```
GRANT REPLICATION CLIENT, REPLICATION SLAVE ON *.* TO 'repl'@'%' identified by
'replpass';
```

7. Add the replication tables. For example, we add the tables to DC1:

```

create database if not exists percona;
use percona;
CREATE TABLE `replication` (
  `host` varchar(40) NOT NULL,
  `weight` int(11) NOT NULL DEFAULT 0,
  `localIndex` int(11) DEFAULT NULL,
  `isSlave` enum('No','Yes','Proposed','Failed') DEFAULT 'No',
  `lastUpdate` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP ON UPDATE
CURRENT_TIMESTAMP,
  `lastHeartbeat` timestamp NOT NULL DEFAULT '1971-01-01 00:00:00',
  `connectionName` varchar(64) NOT NULL,
  PRIMARY KEY (`connectionName`,`host`),
  KEY `idx_host` (`host`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
CREATE TABLE `cluster` (
  `cluster` varchar(31) NOT NULL,
  `masterCandidates` varchar(255) NOT NULL,
  `replCreds` varchar(255) NOT NULL,
  PRIMARY KEY (`cluster`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
CREATE TABLE `link` (
  `clusterSlave` varchar(31) NOT NULL,
  `clusterMaster` varchar(31) NOT NULL,
  PRIMARY KEY (`clusterSlave`,`clusterMaster`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
CREATE TABLE `weight` (
  `cluster` varchar(31) NOT NULL,
  `nodename` varchar(255) NOT NULL,
  `weight` int NOT NULL DEFAULT 0,
  PRIMARY KEY (`cluster`,`nodename`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

```

The replication manager writes to the tables. You do not need to adjust the tables.

8. The cluster table contains the details of each cluster. The cluster name is defined in the `wsrep_cluster_name` variable value:

```

INSERT INTO `cluster` VALUES ('DC1','10.0.4.160 10.0.4.162
10.0.4.163','source_user=\'repl\'', source_password=\'replpass\');
INSERT INTO `cluster` VALUES ('DC2','10.0.4.164 10.0.4.165
10.0.4.166','source_user=\'repl\'', source_password=\'replpass\');
INSERT INTO `cluster` VALUES ('DC3','10.0.4.167 10.0.4.168
10.0.4.169','source_user=\'repl\'', source_password=\'replpass\');

```

9. Add the required links:

```
INSERT INTO `link` VALUES ('DC1','DC2');
INSERT INTO `link` VALUES ('DC1','DC3');
INSERT INTO `link` VALUES ('DC2','DC1');
INSERT INTO `link` VALUES ('DC3','DC1');
```

10. Add the weight:

```
INSERT INTO `weight` VALUES('DC1','DC1-1',10);
INSERT INTO `weight` VALUES('DC1','DC1-2',11);
INSERT INTO `weight` VALUES('DC2','DC2-1',9);
INSERT INTO `weight` VALUES('DC2','DC2-2',12);
INSERT INTO `weight` VALUES('DC3','DC3-1',11);
```

The node in the cluster with the highest value is the first to be selected.

11. Provision the remote clusters and start replication.

On one of the DC1 nodes, for example DC1-1, perform a `mysqldump` as root or using `sudo`:

```
[root@DC1-1 ~]# mysqldump -u root -p --source-data=2 --single-transaction -R -A -E > dump.sql
```

12. Compress the file if it's too large. You can use [Percona XtraBackup to compress the data](#). Copy the backup file to one node in each remote cluster, for example to DC2-1 and DC3-1.

To restore the dump, run the following commands as root or using `sudo`:

```
[root@DC2-1 ~]# mysql -u root -p < dump.sql
```

and

```
[root@DC3-1 ~]# mysql -u root -p < dump.sql
```

13. Configure the replication. Set up the first replication links manually.

For example, on DC2-1 run:

```
mysql> change replication source to source_host='WAN IP of DC1-1',
source_user='repl', source_password='replpass', SOURCE_AUTO_POSITION = 1 FOR
CHANNEL 'DC2-DC1';
mysql> start replica FOR CHANNEL 'DC2-DC1';
```

on DC3-1 run:

```
mysql> change replication source to source_host='WAN IP of DC1-1',
source_user='repl', source_password='replpass', SOURCE_AUTO_POSITION = 1 FOR
CHANNEL 'DC3-DC1';
mysql> start replica FOR CHANNEL 'DC3-DC1';
```

For the other direction, use DC1-1 for both:

```
mysql> change replication source to source_host='WAN IP of DC2-1',
source_user='repl', source_password='replpass', SOURCE_AUTO_POSITION = 1 FOR
CHANNEL 'DC1-DC2';
mysql> start replica FOR CHANNEL 'DC1-DC2';
mysql> change replication source to source_host='WAN IP of DC3-1',
source_user='repl', source_password='replpass', SOURCE_AUTO_POSITION = 1 FOR
CHANNEL 'DC1-DC3';
mysql> start replica FOR CHANNEL 'DC1-DC3';
```

Now, all the clusters are linked in a source to source way.

14. Install and enable Percona XtraDB Cluster-based variant of Percona Distribution for MySQL as described in [Install Percona Distribution for MySQL](#).
15. Install the packages for `replication_manager.sh` script depending on your operating system. On each node, perform the following steps as root or using sudo:

#### On Debian and Ubuntu Linux

```
$ sudo apt install percona-replication-manager
```

#### On Red Hat Enterprise Linux and derivatives

```
$ sudo yum install percona-replication-manager
```

When executed for the first time, the replication manager detects the current replication links and inserts rows in to the `percona.replication` table. In order to avoid issues, start with the replica nodes. The mysql credentials should be specified in the `/root/.my.cnf` file. On these nodes (DC1-1, DC2-1 and DC3-1), execute the script manually:

```
$ /usr/bin/replication_manager.sh
```

The replication state should be unchanged and the `percona.replication` table should contain the following rows:

```
mysql> SELECT * FROM percona.replication;
```



### Expected output



```
+-----+-----+-----+-----+-----+-----+-----+
| host | weight | localIndex | isSlave | lastUpdate | lastHeartbeat |
|-----+-----+-----+-----+-----+-----+-----+
| DC1-1 | 10 | 1 | Yes | 2017-06-30 13:03:01 | 2017-06-30 13:03:01 |
| DC1-DC2 | | | | | |
| DC1-1 | 11 | 1 | Yes | 2017-06-30 13:03:01 | 2017-06-30 13:03:01 |
| DC1-DC3 | | | | | |
| DC2-1 | 9 | 1 | Yes | 2017-06-30 13:03:01 | 2017-06-30 13:03:01 |
| DC2-DC1 | | | | | |
| DC3-1 | 11 | 1 | Yes | 2017-06-30 13:03:01 | 2017-06-30 13:03:01 |
| DC3-DC1 | | | | | |
+-----+-----+-----+-----+-----+-----+-----+
12 rows in set (0.00 sec)
```

If you have issues on these step, see the [Replication manager troubleshooting](#) document.

On these same nodes, enable the cron job:

```
* * * * * /usr/bin/replication_manager.sh
```

Wait at least one minute and proceed with the other nodes. Try a manual run first to see if the script adds a line to the replication table for the host, for example, isSlave = No. Then add the cron jobs.

```
mysql> SELECT * FROM percona.replication;
```



## Expected output



```
+-----+-----+-----+-----+-----+-----+-----+
-----+
| host | weight | localIndex | isSlave | lastUpdate | lastHeartbeat |
|-----+-----+-----+-----+-----+-----+
| DC1-1 | 10 | 1 | Yes | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC1-DC2 |
| DC1-2 | 11 | 2 | No | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC1-DC2 |
| DC1-3 | 9 | 0 | No | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC1-DC2 |
| DC1-1 | 11 | 1 | Yes | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC1-DC3 |
| DC1-2 | 12 | 2 | No | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC1-DC3 |
| DC1-3 | 0 | 0 | No | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC1-DC3 |
| DC2-1 | 0 | 1 | Yes | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC2-DC1 |
| DC2-2 | 0 | 0 | No | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC2-DC1 |
| DC2-3 | 0 | 2 | No | 2017-06-19 15:58:01 | 2017-06-19 15:58:01 |
DC2-DC1 |
| DC3-1 | 0 | 1 | Yes | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC3-DC1 |
| DC3-2 | 0 | 2 | No | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC3-DC1 |
| DC3-3 | 0 | 0 | No | 2017-06-30 13:13:01 | 2017-06-30 13:13:01 |
DC3-DC1 |
+-----+-----+-----+-----+-----+-----+
-----+
```



## See also

To manage a single replica, see [Single replica manager for Percona XtraDB Cluster](#).

# Replication manager troubleshooting

The [replication manager](#) script outputs its trace (bash -x) to the file `/tmp/replication_manager.log` if present. If there is an error during the manual invocation or something unexpected happens, touch the file, run the script manually and look at the file content for hints. If you think there is a bug, create an issue on [GitHub](#).



# Single replica manager for Percona XtraDB Cluster

This feature is a tech preview. Before using this feature in a production environment, follow these steps:

- Test restoring production from physical backups in your environment.
- Use an alternative backup method to ensure redundancy.

The single replica manager is a simplified version of the [Replication manager for Percona XtraDB Cluster](#) and is intended to manage a single replica.

The single replica manager requires using a [global transaction identifier \(GTID\)](#) (Oracle implementation).

To use the single replica manager script, edit the script and adjust the 'sourceCandidates' and 'replCreds' variables. If the Percona XtraDB Cluster nodes are '10.1.1.10', '10.1.1.11', and '10.1.1.12', and the replication user is 'repluser' with a password set to 'replpass', the variables should look like the following:

```
sourceCandidates="10.1.1.10 10.1.1.11 10.1.1.12"
replCreds="source_user='repl', source_password='replpass' "
```

The credentials to the local MySQL server should be located in the `~/ .my.cnf` file of the user under which the cron job is defined. The last step is to enable the cron job that runs every minute:

```
* * * * * /usr/bin/replication_manager.sh
```

If you face any issues, do the following:

```
touch /tmp/replication_manager.log
chmod a+w /tmp/replication_manager.log
```

Check the `bash trace` file for any issues. During the maintenance on the replica, do the following:

```
touch /tmp/replication_manager.off
```

Once the maintenance is over, remove the file.

# Uninstall

# Uninstalling Percona Distribution for MySQL

To uninstall Percona Distribution for MySQL, stop the `mysql` service and remove all the installed packages using the package manager of your operating system. Optionally, disable Percona repository.



## Note

Should you need the data files later, back up your data before uninstalling Percona Distribution for MySQL.

## Uninstall Percona Server-based variant



### Important

Run all commands as the root user or via `sudo`

## On Debian / Ubuntu

1. Stop the `mysql` service.

```
$ sudo systemctl stop mysql
```

2. Remove *Percona Server for MySQL*.

```
$ sudo apt remove percona-server*
```

3. Remove the components. Use the following commands to remove the required components.

- Remove Percona XtraBackup

```
$ sudo apt remove percona-xtrabackup-80
```

- Remove Percona Toolkit

```
$ sudo apt remove percona-toolkit
```

- Remove Orchestrator

```
$ sudo apt remove percona-orchestrator*
```

- Remove MySQL Shell

```
$ sudo apt remove percona-mysql-shell
```

- Remove ProxySQL

```
$ sudo apt remove proxysql2
```

- Remove MySQL Router

```
$ sudo apt remove percona-mysql-router
```

## On Red Hat Enterprise Linux / derivatives

1. Stop the `mysql` service.

```
$ sudo systemctl stop mysql
```

2. Remove *Percona Server for MySQL*.

```
$ sudo yum remove percona-server*
```

3. Remove the components. Use the commands below to remove the required components.

- Remove Percona XtraBackup

```
$ sudo yum remove percona-xtrabackup-80
```

- Remove Percona Toolkit

```
$ sudo yum remove percona-toolkit
```

- Remove Orchestrator

```
$ sudo yum remove percona-orchestrator*
```

- Remove MySQL Shell

```
$ sudo yum remove percona-mysql-shell
```

- Remove ProxySQL

```
$ sudo yum remove proxysql2
```

- Remove MySQL Router

```
$ sudo yum remove percona-mysql-router
```

**Uninstall Percona XtraDB Cluster-based variant**



### Important

Run all commands as the root user or via `sudo`

## On Debian / Ubuntu

1. Stop the `mysql` service.

```
$ sudo systemctl stop mysql
```

2. Remove *Percona XtraDB Cluster*.

```
$ sudo apt remove percona-xtradb-cluster
```

3. Remove the components. Use the commands below to remove the required components.

- Remove Percona XtraBackup

```
$ sudo apt remove percona-xtrabackup-80
```

- Remove Percona Toolkit

```
$ sudo apt remove percona-toolkit
```

## On Red Hat Enterprise Linux / derivatives

1. Stop the `mysql` service.

```
$ sudo systemctl stop mysql
```

2. Remove *Percona Server for MySQL*.

```
$ sudo yum remove percona-xtradb-cluster
```

3. Remove the components. Use the commands below to remove the required components.

- Remove Percona XtraBackup

```
$ sudo yum remove percona-xtrabackup-80
```

- Remove Percona Toolkit

```
$ sudo yum remove percona-toolkit
```





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# Glossary

## ACID

Set of properties that guarantee database transactions are processed reliably. Stands for [Atomicity](#), [Consistency](#), [Isolation](#), [Durability](#).

## Asynchronous replication

Asynchronous replication is a technique where data is first written to the primary node. After the primary acknowledges the write, the data is written to secondary nodes.

## Atomicity

Atomicity means that database operations are applied following an “all or nothing” rule. A transaction is either fully applied or not at all.

## Consistency

In the context of backup and restore, consistency means that the data restored will be consistent in a given point in time. Partial or incomplete writes to disk of atomic operations (for example, to table and index data structures separately) won't be served to the client after the restore. The same applies to multi-document transactions, that started but didn't complete by the time the backup was finished.

## Disaster recovery

Disaster recovery are means to regain access and functionality of a database infrastructure after unplanned events that caused its failure.

## Downtime

Downtime is the period when a database infrastructure is unavailable due to expected (maintenance) or unexpected (outage, lost connectivity, hardware failure, etc.) reasons.

## Durability

Once a transaction is committed, it will remain so.

## Failover

Failover is switching automatically and seamlessly to a reliable backup system.

## General availability (GA)

A finalized version of the product which is made available to the general public. It is the final stage in the software release cycle.

## GTID

A global transaction identifier (GTID) is a unique identifier created and associated with each transaction committed on the server of the source. This identifier is unique across all servers in a given replication topology.

## High availability

A high availability is the ability of a system to operate continuously without failure for a long time.

## Isolation

The Isolation requirement means that no transaction can interfere with another.

## Loosely-coupled cluster

A loosely-coupled cluster is the deployment where cluster nodes are independent in processing / applying transactions. Data state may not always be consistent in time on all nodes; however, a single node state does not affect the cluster. Loosely-coupled clusters use [asynchronous replication](#) and can be geographically distributed and/or serve as the [disaster recovery](#) site.

## Multi-source replication

A multi-source replication topology requires at least one replica synchronized with at least two sources. The transactions can be received in parallel because the replica creates a separate replication channel for each source.

Multi-source replication allows a single server to back up or consolidate data from multiple servers. This type of replication also lets you merge table shards.

## Nines of availability

Nines of availability refer to system availability as a percentage of total system time.

## Semi-synchronous replication

A semi-synchronous replication is a technique where the primary node wait for at least one of the secondaries to acknowledge the transaction before processing further transactions.

## Synchronous replication

A synchronous replication is a technique when data is written to the primary and secondary nodes simultaneously. Thus, both primary and secondaries are in sync and failover from the primary to one of the secondaries is possible any time.

## Tech preview

A tech preview item can be a feature, a variable, or a value within a variable. The term designates that the item is not yet ready for production use and is not included in support by SLA. A tech preview item is included in a release so that users can provide feedback. The item is either updated and released as [general availability\(GA\)](#) or removed if not useful. The item's functionality can change from tech preview to GA.

## Tightly-coupled cluster

A tightly-coupled cluster is the deployment in which transactions and information is synchronously distributed, consistent and available on all cluster nodes at any time.

## Uptime

Uptime is the time when the system is continuously available.