MySQL Shell 8.4 Release Notes

Abstract

This document contains release notes for the changes in MySQL Shell 8.4.

For additional MySQL Shell documentation, see http://dev.mysql.com/.

Updates to these notes occur as new product features are added, so that everybody can follow the development process. If a recent version is listed here that you cannot find on the download page (https://dev.mysql.com/downloads/), the version has not yet been released.

The documentation included in source and binary distributions may not be fully up to date with respect to release note entries because integration of the documentation occurs at release build time. For the most up-to-date release notes, please refer to the online documentation instead.

For legal information, see the Legal Notices.

For help with using MySQL, please visit the MySQL Forums, where you can discuss your issues with other MySQL users.

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Preface and Legal Notices

This document contains release notes for the changes in MySQL Shell 8.4.

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Changes in MySQL Shell 8.4.5 (2025-04-15, LTS Release)

- Utilities Added or Changed Functionality

- Utilities Bugs Fixed

- Bugs Fixed

Utilities Added or Changed Functionality

- The `mysql_option_tracker_persister` role is now excluded from the dump when `ocimds: true` and is excluded when loading a dump into a MySQL HeatWave DB System. (Bug #37457569)

Utilities Bugs Fixed

- Dump and load operations failed randomly due to a bug in the bundled Curl package.

  Curl is upgraded to 8.12.1 in this release. (Bug #37576066)

- MySQL Shell was updated for compatibility with the privilege changes made in MySQL HeatWave Service.

  The following privileges were added to MySQL HeatWave Service:

  - `FLUSH_PRIVILEGES`

  - `TRANSACTION_GTID_TAG`

  (Bug #37513534)

- Dump and load utilities did not retry transfers to HTTP storage if an error occurred. They also did not report HTTP errors when reading from HTTP storage. This also affected PARs.

  As of this release, transfers are retried and HTTP errors are reported. (Bug #37408073)

- `util.importTable()`, importing from a single file, could close unexpectedly if one of the background threads encountered an error. An error similar to the following was displayed:

```
libc++abi: terminating
stack trace
```

  (Bug #37408046)

Bugs Fixed

- Under certain circumstances MySQL Shell could crash during auto-completion on options such as `shell.options.history.auto`. (Bug #37528585)

Changes in MySQL Shell 8.4.4 (2025-01-21, LTS Release)

- AdminAPI Bugs Fixed
- Utilities Added or Changed Functionality
- Utilities Bugs Fixed
- Functionality Added or Changed
- Bugs Fixed

AdminAPI Bugs Fixed

- `replicationLag` of `ReplicaSet.status()` returned `null` if replication was idle.

  As of this release, the following changes were made:

  - `replicationLag` is set to `null` if the replication connection, or SQL thread, is not running.

  - `replicationLag` is set to `applier_queue_applied` when the last queued transaction matches the last applied transaction, or the applying transaction count is 0 (zero).

  (Bug #35914505)

- It was not possible to remove a member from a ReplicaSet using `ReplicaSet.removeInstance()` with the `force` option enabled, if the member was in an ERROR state. (Bug #35282392)

- The ReplicaSet metadata schema table, `INSTANCES`, was not populated properly when upgrading the metadata schema to version 2.2.0. As a result, MySQL Router did not recognize the topology and rejected connections to it. (Bug #116231, Bug #37101286)

Utilities Added or Changed Functionality

- The schema `MYSQL_AUTOPILOT` is excluded by dump and load operations with `ocimds:true`. (Bug #37278169)

- As of this release, the upgrade checker utility writes all compatibility issues and fixes to the log file, instead of only writing to the console. (Bug #37154456)

Utilities Bugs Fixed

- If `convertBsonTypes` was enabled, the JSON import utility failed when importing negative BSON values.

  An error similar to the following was returned:

  ```
  ValueError: Unexpected data, expected to find an integer string processing extended JSON for $nu
  ```

  (Bug #37243264)

- Amazon RDS made the following changes in 8.0.36:

  - It is no longer possible to grant `BACKUP_ADMIN`.

  - It is no longer possible to lock MySQL system tables.

  As a result, consistent dumps from Amazon RDS are not possible.

  As of this release, if locking the MySQL system tables fails with an Access Denied error, a warning is printed and the dump continues.

Additionally, for non-Amazon RDS instances, if the user has the `BACKUP_ADMIN` privilege and `LOCK INSTANCE FOR BACKUP` succeeds, the MySQL system tables are not locked. (Bug #37226153)

- Under certain circumstances, such as a large amount of data chunking, the `maxRate` dump option did not properly limit the throughput due to a gap between the start of the dump and the start of the data dump. As of this release, `maxRate` is used only when data is being dumped. (Bug #37216767)

- MySQL Shell could hang when running a dump with `consistent: true` under an account which lacked privileges to execute `FLUSH TABLES WITH READ LOCK`.

  As of this release, query events are checked only if they contain data, and `GRANT` and `REVOKE` statements are flagged as unsafe. (Bug #37158908)

Functionality Added or Changed

- As of this release, the Google V8 JavaScript engine is replaced by Oracle GraalVM. (Bug #34370637)

Bugs Fixed

- In MySQL Shell 8.0.40, RPM installation failed on Oracle Linux 8 due to a dependency on Python 3.9. As of this release, MySQL Shell bundles Python 3.13. (Bug #37479400)

- Under certain circumstances, a Ctrl+c key combination could lead to a deadlock. (Bug #35998250)

Changes in MySQL Shell 8.4.3 (2024-10-15, LTS Release)

- AdminAPI Bugs Fixed

- Utilities Added or Changed Functionality

- Utilities Bugs Fixed

- Bugs Fixed

AdminAPI Bugs Fixed

- Running a `rescan()` operation on a Replica Cluster, could result in a warning that `group_replication_view_change_uuid` is required, but not configured. This occurred in a mixed version ClusterSet, where the primary Cluster is on version 8.3.0, or higher, and the replicas were on versions lower than 8.3.0. The check for `group_replication_view_change_uuid` was incorrectly performed on the primary Cluster instead of the target Replica Cluster. (Bug #36657936)

- If clone-based recovery failed while adding an instance, the instance and Cluster could be left in an inconsistent state, returning multiple errors, and unrecoverable by `rescan()`. It was not possible to remove the instance with `remove_instance()`, either.

  `add_instance()` did not properly handle clone-related errors and did not stop Group Replication if errors were detected.

  As of this release, `add_instance()` handles clone-related errors, reverts the state of the target instance and stops Group Replication on that instance. (Bug #36657628)

- Running AdminAPI operations against MySQL 5.7 instances resulted in an error, due to an attempt to run a query on a non-existent Performance Schema table.

  As of this release, error handling is included to account for such issues. (Bug #36652642)

- It was possible to define duplicate instance definitions in the `replicationSources` list of the `Cluster.add_replica_instance()` operation. The operation failed with an error.

As of this release, the `replicationSources` list is validated for such duplicates in all operations which use it. The operation fails with an informative error. (Bug #36614218)

- AdminAPI commands which add or rejoin instances to Clusters using Clone did not check the existing members for compatibility. If no compatible members were available, Group Replication fell back to incremental recovery which can fail if Clone was the only supported provisioning method. An unexpected and unhelpful error was returned.

  As of this release, the following commands have been updated to check compatibility and provide appropriate feedback:

  - `ReplicaSet.add_instance()`

  - `ReplicaSet.rejoin_instance()`

  - `Cluster.add_replica_instance()`

  - `Cluster.rejoin_instance()`

  - `ClusterSet.create_replica_cluster()`

  For a donor to be considered compatible for a recipient:

  - They must be running on the same operating system.

  - They must be running on the same platform.

  - The versions must be compatible:

    - Both must be version 8.0.17, or higher.

    - If both are version 8.0.37, or higher, only their major and minor versions need match. For example, 8.4.0 and 8.4.3.

    - For versions 8.0.17, or higher, and lower than 8.0.37, the major, minor, and patch numbers must match.

  (Bug #36054619, Bug #36682741)

Utilities Added or Changed Functionality

- As of this release, the `MYSQL_OPTION` schema is excluded by the dump utilities when `ocimds: true` and is automatically excluded when loading a dump into a MySQL HeatWave DB System. (Bug #37023079)

- The compatibility option, `unescape_wildcard_grants`, is added in this release. When enabled, this strips escape characters in grants on schemas, replacing escaped `\_` and `\%` wildcards in schema names with `_` and `%` wildcard characters. When the `partial_revokes` system variable is enabled, the `\` character is treated as a literal, which could lead to unexpected results. It is strongly recommended to check each such grant before enabling this option. (Bug #36524862)

- The index creation step of a load operation now includes percentage completion information. (Bug #35495220)

Utilities Bugs Fixed

- The upgrade checker utility returned a false positive for foreign keys defined on tables in the Cluster metadata schema. (Bug #36975599)

- Under certain circumstances, using zstd compression, the dump utilities could generate corrupted data files. (Bug #36836188)

- Attempting to run the dump or copy utilities from MySQL Shell 8.0.x against a more recent version of the server, such as 8.4.0, could result in a syntax error.

  Many breaking changes have been made to MySQL syntax and configuration between 8.0.37 and 8.4.x, and higher, such as replacing `SHOW MASTER STATUS` with `SHOW BINARY LOG STATUS`, for example. There were also many removals. See the release notes for those server versions for more information.

  As of this release, the dump and copy utilities raise an error when such incompatibilities are detected and recommend the appropriate MySQL Shell upgrade.

  > ⚠️ **Important**
  >
  > It is always recommended to use the latest version of MySQL Shell.

  (Bug #36701854)

- Running any of the diagnostics utilities against an instance with binary logging disabled, and using an X Protocol connection, resulted in an error.

  As of this release, the diagnostics utilities use classic connections, only. If the user connects to an instance using X Protocol, and runs any of the diagnostics utilities, they automatically establish a classic connection to the instance. (Bug #36613129)

- The upgrade checker utility returned an error claiming that it was not possible to upgrade from MySQL 8.0.x to MySQL 8.4.x. This upgrade path is possible.

  See Upgrade Paths for information. (Bug #115798, Bug #36930714)

- Running the diagnostic utility `util.debug.collectDiagnostics` with the parameter `schemaStats:true` returned MySQL Error 1242 if a table had more than one column of type BLOB. (Bug #115033, Bug #36658194)

- The upgrade checker utility reported Zero Date errors for views using the `NOW()` and `SYSDATE()` functions.

  As of this release, views are excluded from the Zero Date check. (Bug #114347, Bug #36403042)

Bugs Fixed

- MySQL Shell failed to start if installed by MSI on Microsoft Windows 11 with Visual Studio Redistributable version 14.3x or lower. On Windows platforms, MySQL Shell requires Visual Studio Redistributable version 14.4x or higher.

  See Microsoft Visual C++ Redistributable latest supported downloads. (Bug #37049411)

- The MySQL Shell MSI progress dialogs displayed numbered placeholders instead of the installation values. (Bug #37033676)

- When running MySQL Shell over SSH, if a command was entered on the command line, but not executed, closing the SSH session could result in the command being executed without user input. (Bug #36861912)

- MySQL Shell set the environment variable `PYTHONHOME` on all platforms even if Python was not bundled. As of this release, `PYTHONHOME` is no longer set and the bundled Python executable is moved to another directory on Windows platforms, which corresponds to the structure used by a standalone Python installation. (Bug #36836320)

- The Python library `hashlib` could not be imported on MacOS platforms. (Bug #36803237)

- It was not possible to start MySQL Shell on Oracle Linux 8 running on ARM platforms if `PAGE_SIZE` was set to 64K. An error similar to the following was displayed:

```
mysqlsh: error while loading shared libraries:
libantlr4-runtime.so.4.10.1: ELF load command alignment
not page-aligned
```

(Bug #36792750)

- MySQL Shell did not register interactive connections as interactive. As a result, the system variable `interactive_timeout` was not honored.

  As of this release, interactive connections are treated as such. You can also define a connection as interactive with the new MySQL Shell connection option, `client-interactive`. (Bug #36339280)

- The URI parser threw an exception if the URI contained an unescaped @ character. (Bug #36105235)

Changes in MySQL Shell 8.4.2 (Not released, LTS Release)

Version 8.4.2 has no release notes, or they have not been published because the product version has not been released.

Changes in MySQL Shell 8.4.1 (2024-07-01, LTS Release)

- [AdminAPI Bugs Fixed](#)

- [Utilities Added or Changed Functionality](#)

- [Utilities Bugs Fixed](#)

- [Bugs Fixed](#)

AdminAPI Bugs Fixed

- MySQL Shell closed unexpectedly when calling certain AdminAPI functions on EL7 platforms. (Bug #36651010)

- `dba.reboot_cluster_from_complete_outage()` disabled `super_read_only` on the primary member of an INVALIDATED Cluster. As a result, clients continued to perform updates and introduce errant transactions.

  As of this release, `dba.reboot_cluster_from_complete_outage()` enables `super_read_only` on the primary member and disables the Group Replication action `mysql_disable_super_read_only_if_primary`. (Bug #36562916)

- If an attempt to create a Replica Cluster failed due to a timeout and the revert also failed due to a timeout, the Replica Cluster could be left in an inconsistent state; ONLINE, but not associated with the ClusterSet's metadata. This specific issue was caused by low values for `wait_timeout` and `interactive_timeout`.

  The following changes were made:

  - `wait_timeout` is checked and, if set to a value lower than the default of 8 hours, is set to 8 hours.

  - `Cluster.rescan()` is extended with a new option, `repairMetadata` which can be enabled to resolve inconsistencies in the Cluster's metadata.

  - `Cluster.dissolve()` can now be used on Clusters in this inconsistent state.

  (Bug #36495756)

Utilities Added or Changed Functionality

- The following check was added to the Upgrade Checker utility:

  - `foreignKeyReferences`: Checks for foreign keys referencing non-unique and partial indexes.

  (Bug #36553868)

Utilities Bugs Fixed

- The formatting of the report returned by the Upgrade Checker utility's `invalidPrivilege` check is improved in this release. Instead of returning a message for each user, the users are grouped with the message. (Bug #36613895)

- As of this release, all failed connections to the supported object storage platforms are retried three times, with a 1 second delay between retries.

  If a failure occurs 10 minutes after the connection was created, the delay is changed to an exponential back-off strategy:

  - First delay: 3-6 seconds

  - Second delay: 18-36 seconds

  - Third delay: 40-80 seconds

  (Bug #36597063, Bug #36256053)

  References: See also: Bug #35396788.

- `restrict_fk_on_non_standard_key`, introduced in MySQL 8.4.0, prohibits creation of foreign keys which reference only part of a composite key when enabled. This system variable is enabled by default on MySQL HeatWave Service and resulted in errors loading dumps which contained such keys when detected by the Upgrade Checker utility's `foreignKeyReferences` check.

  As of this release, a new compatibility option is added the dump utilities, `force_non_standard_keys`. This disables checks for non-standard foreign keys, and cause the loader to set the session value of `restrict_fk_on_non_standard_key` to OFF. (Bug #36553849)

- Primary keys defined on an `ENUM` column were reported as missing for dumps with `ocimds:true`. This was caused by a fix in an earlier version which instructed the dump utility to ignore primary keys or unique indexes which contain one or more `ENUM` columns when selecting an index for chunking.

  As of this release, information about the index selected for chunking and whether the table has a primary key is separated. (Bug #36493316)

  References: See also: Bug #35180061.

- It was not possible to run the Upgrade Checker utility against an MySQL HeatWave Service DB System. An error was returned relating to missing `RELOAD` privileges. `RELOAD` is not granted to MySQL HeatWave Service users.

  `RELOAD` is not required by the Upgrade Checker when run against MySQL HeatWave Service DB Systems, it is only required against MySQL 5.7.x. As such, the requirement is removed in this release. (Bug #36361159)

- The Upgrade Checker utility did not validate the value of the `configPath` parameter.

  As of this release, the value of `configPath` is validated before running the upgrade checks. (Bug #36332625)

- The Upgrade Checker utility behaved inconsistently in the absence of certain privileges. Sometimes returning an error and sometimes attempting to run its checks. (Bug #36332031)

- The Upgrade Checker utility's `sysvarAllowedValues` did not take into account empty strings as valid values for certain variables, such as `ssl_cipher`, resulting in false negative errors in the report. (Bug #36298612)

- It was not possible to use the Copy utilities with certain MySQL-compatible databases. SQL syntax errors were returned. (Bug #36297963)

- `util.collect_diagnostics()` failed with an `AttributeError` when run against an InnoDB Cluster on which the Group Replication plugin was uninstalled from one or more members. The utility attempted to retrieve values for Group Replication system variables which did not exist because the plugin was uninstalled.

  Thanks to Ioannis Androulidakis for the contribution. (Bug #114707, Bug #36589677)

- Under certain circumstances, the Upgrade Checker utility's reserved keywords check did not generate warnings for the `FULL` and `INTERSECT` keywords. (Bug #114423, Bug #36424093)

- Fixed an issue with non-ASCII character handling in the Upgrade Checker utility's `schemaInconsistency` check.

  Thanks to Daniel Lenski and Amazon for the contribution. (Bug #114127, Bug #36340714)

Bugs Fixed

- MySQL Shell closed unexpectedly if a native Python object was passed to a Python plugin function. (Bug #36502096)

- MySQL Shell did not prompt for a password if `-p` was specified on the command line without an argument. (Bug #36433418)

- Under certain circumstances, a password prompt was not returned although no password was provided on the command line or defined in a configuration file. (Bug #36422502, Bug #36422492)

- `--no-password` did not work if a password was defined in the server's configuration file or if it was provided earlier in the command line. (Bug #36422408)

- If `logSql` was set to `ERROR`, MySQL Shell logged the SQL without filtering for unsafe statements. As of this release, the pattern defined in `logSql.ignorePatternUnsafe` is used to filter unsafe SQL from the log.

  Also, the pattern which triggered the filter is logged. (Bug #36014067)

- Special characters, such as tab or newline, were not supported in utility calls from the command line. For example, in the following command, `\t` was not properly handled:

  ```
  > mysqlsh root@localhost -- util import-table sample_us.tsv --schema=test --table=samples --fieldsTermin
  ```

  (Bug #34887426)

- Upgrading MySQL Shell 8.0.35, or higher, on Windows platforms, resulted in multiple installations instead of overwriting the existing installation. (Bug #113732, Bug #36259270)

Changes in MySQL Shell 8.4.0 (2024-04-30, LTS Release)

> ⚠️ **Important**
>
> AdminAPI no longer supports MySQL 5.7. Any AdminAPI command run against that version returns an error.

Deprecation and Removal Notes

- The helper command, `--dba=enableXProtocol`, is deprecated and subject to removal in a future release. (Bug #36380502)

- AdminAPI no longer uses the deprecated Group Replication system variable, `group_replication_allow_local_lower_version_join`. (Bug #36187059)

- The following functionality, deprecated in previous releases, was removed in this release:

  - The following command line arguments:

    - `--ssl`

    - `--node`

    - `--classic`

    - `--sqln`

    - `--import`

    - `--recreate-schema`

    - `--dbuser`. The corresponding API attribute, `dbUser` was also removed.

    - `--dbpassword`. The corresponding API attribute, `dbPassword` was also removed.

    - `-n` and `-c` were removed from the `\connect` command.

    - `--fido-register-factor`. The plugins `authentication_fido` and `authentication_fido_client` are no longer packaged with MySQL Shell.

  - The following functions:

    - `arrayDelete()` and `merge()` were removed from `CollectionModify`.

    - `skip()` was removed from `CollectionFind`.

    - `getWarningCount()` was removed from `BaseResult`.

    - `getAffectedItemCount()` was removed from `Result`.

    - `getAffectedRowCount() and nextDataSet() were removed from SqlResult` .

    - `query()` was removed from `ClassicSession`.

  The `ociParManifest` and `ociParExpireTime` options were removed from the Dump utilities. (WL #11816, WL #15955)

- The following, deprecated in previous releases, have been removed from AdminAPI:

  - Commands:

    - `dba.configureLocalInstance()`

    - `cluster.checkInstanceState()`

  - Options:

    - `ipWhitelist` was removed from all commands which contained it.

    - `connectToPrimary` was removed from `dba.getCluster()`.

    - `clearReadOnly` was removed from all commands which contained it.

    - `failoverConsistency` was removed from all commands which contained it.

    - `multiMaster` was removed from `dba.createCluster()`.

    - `groupSeeds` was removed from all commands which contained it.

    - `memberSslMode` was removed from `cluster.addInstance()` and `cluster.rejoinInstance()`.

    - `queryMembers` was removed from `cluster.status()`.

    - `user` and `password` were removed from all commands which contained them.

    - `interactive` was removed from all commands which contained it.

    - `waitRecovery` was removed from all commands which contained it.

    - `updateTopologyMode` was removed from `cluster.rescan()`.

  (WL #15870)

AdminAPI Added or Changed Functionality

- As of MySQL 8.4.0, the default value of `group_replication_consistency` is changed from `EVENTUAL` to `BEFORE_ON_PRIMARY_FAILOVER`. As a result, the corresponding option in the AdminAPI, `consistency` was updated for MySQL 8.4.0 or higher. For previous versions, the default remains `EVENTUAL`. (Bug #36057775)

- Cloning version compatibility checks for donor and recipient instances are relaxed. As of this release, with certain conditions, only the major and minor version numbers need to match, the patch number is now disregarded.

  The following conditions apply:

  - Only version 8.0.17, or higher, can perform cloning.

  - If both versions are 8.0.37, or higher, only the major and minor versions are required to match.

  - If the version is 8.0.17, or higher, and less than 8.0.37, major, minor, and patch numbers must match.

  (Bug #36054489)

- InnoDB Cluster Read Replicas now support certificate-based authentication.

  The following changes were made to the `cluster.addReplicaInstance()` method:

- The option `certSubject` was added. This option specifies the certificate subject of the instance, used if the Cluster's `memberAuthType` is `CERT_SUBJECT` or `CERT_SUBJECT_PASSWORD`.

- The method now uses the Cluster's `memberSslMode` value to configure the authentication type of the Read Replica's replication channel.

- The method performs a connectivity check, using the configured `memberSslMode` before updating the topology.

- If the Cluster's `memberAuthType` is `CERT_SUBJECT` or `CERT_SUBJECT_PASSWORD`, the method verifies the server's certificate.

  `cluster.options()` was updated to return `certSubject` in the `topology` array. (WL #16123)

- As of this release, MySQL Router exposes its configuration in the Cluster metadata for all routers bootstrapped against it. This information is stored as JSON in the Cluster metadata schema and can be accessed by the MySQL Shell operation, `object.routerOptions()` for Cluster, ClusterSet, and ReplicaSets.

  See Working with a Cluster's Routers.

  The operation `object.routingOptions()` is deprecated and scheduled for removal in a future release. (WL #15954)

AdminAPI Bugs Fixed

- The documentation for Rescanning a Cluster did not make clear that while `group_replication_transaction_size_limit` is set to the maximum value in Replica Clusters, the original value is stored in the metadata schema and is restored by `Cluster.rescan()` in the event of a switchover or failover. This overwrites any user-defined value set on the Replica Cluster.

  The documentation is updated with this information. (Bug #36494958)

- If the primary instance of a Replica Cluster was changed, attempting to remove that Cluster from the Cluster set failed with the following error:

  ```
  ERROR: Error enabling automatic super_read_only management at secondary:port:
  MySQL Error 3910 (HY000): The function 'group_replication_enable_member_action' failed.
  Member must be the primary or OFFLINE.
  ```

  (Bug #36400360)

- If AdminAPI operations were run against an unsupported version of MySQL, an error was returned. The error did not contain sufficient information.

  As of this release, the error returned contains information on the minimum and maximum versions of MySQL supported by the current version of AdminAPI. (Bug #36338711)

- `clusterSet.setPrimaryCluster` and `replicaSet.setPrimaryCluster` invoked `FLUSH TABLES WITH READ LOCK` when `dryRun` was enabled. These operations no longer invoke that statement for dry runs. (Bug #36314520)

- `cluster.setRoutingOption()` accepted the address as the router name instead of the properly qualified router identifier, `address::router_name`.

  As of this release, the router identifier is properly validated. (Bug #36267549)

- When adding a Read Replica to a cluster which belonged to a ClusterSet, it was possible to specify a replication source which was an instance of the primary or Replica Cluster. This could be done using the `replicationSources` parameter.

As of this release, a check is added which prohibits replication sources which do not belong to the Cluster where the command was run to be used as a Read Replica's replication sources.

This check was also added for the `cloneDonor` parameter of `rejoinInstance()`, `createReplicaCluster()`, and `addReplicaInstance()`.

Also, when calling `setInstanceOption()` with the `replicationSources` parameter, the source is checked to ensure it is not a Read Replica, the same instance, has a valid state, is reachable, and belongs to the correct Cluster. (Bug #36229274)

- It was possible to remove a Cluster member, in a ClusterSet, which belonged to another Cluster. This could result in an unrecoverable ClusterSet.

  As of this release, the instance targeted for removal is checked to ensure it is a member of the Cluster from which the command is run. (Bug #36229123)

- Attempting to use `dba.rebootClusterFromCompleteOutage()` with a Read Replica as seed, resulted in an error similar to the following:

  ```
  Dba.rebootClusterFromCompleteOutage: Group replication does not seem to be active in instance 'db
  ```

  As of this release, the error message provides useful information on what has happened and how to fix it. (Bug #36225607)

- `dba.createReplicaSet` with `adoptFromAR:true` could fail if the host and port values returned were not properly configured on the target instance. The error returned did not provide useful information.

  As of this release, if the target instance does not have properly configured host and port values, it is ignored and the user is informed. (Bug #36201015)

- The system variable `binlog_transaction_dependency_tracking` was deprecated in MySQL 8.0.35 and 8.2.0 and was removed in MySQL 8.4.0. As of MySQL 8.4.0, the server uses the `WRITESET` behavior by default and it is no longer verified or set by the AdminAPI for MySQL 8.4.0.

  The behavior is unchanged for previous versions of MySQL. (Bug #36057800)

- An error should have been returned when `certIssuer`, `certSubject`, `replicationSslMode`, and any value of `certIssuer` other than `PASSWORD` were used when adopting a Cluster or ReplicaSet using `adoptFromGR=true`. Instead, the invalid options were ignored.

  As of this release, `dba.createCluster()` and `dba.createReplicaSet()` validate these options and return an error if they are used with `adoptFromGR=true`. (Bug #36029413)

- Running `Cluster.rejoinInstance()` on an instance in ERROR state, resulted in errors stating that Group Replication settings cannot be changed while Group Replication is running.

  As of this release, running `Cluster.rejoinInstance()` on an instance in ERROR state, automatically stops Group Replication before proceeding with the rejoin process. (Bug #35387205)

- AdminAPI no longer retrieves information from the following tables on MySQL 8.4, or higher:

  - `mysql.slave_master_info`

  - `mysql.slave_relay_log_info`

  The information which was retrieved from those tables is now retrieved from the Performance Schema.

  > **Note**
  >
  > Behavior is unchanged on instances older than MySQL 8.4.

  (Bug #32091724)

Utilities Added or Changed Functionality

- A new entry, `dbObjectType`, is added to the Upgrade Checker utility's JSON output. It contains the type of `dbObject` which caused the check failure.

  See JSON Output from the Upgrade Checker Utility. (Bug #36394895)

- The Upgrade Checker now recommends an upgrade path for older versions. For example, if run against MySQL 5.7, it recommends upgrading to MySQL 8.0 before attempting an upgrade to MySQL 8.4. (Bug #36359408)

- It is now possible to skip the default upgrade check when running a dump utility with `ocimds:true`, using the `skipUpgradeChecks` option.

  See Options for Dump Control. (Bug #36227750)

- The `util.loadDump()` summary is enhanced to show the time required for each stage, and throughput progress now includes rows per second. (Bug #36197620)

- It is now possible to specify the level of compression for gzip and zstd on the `exportTables` and dump utilities.

  - `gzip`: Compression level can be set from 0 to 9. Default compression level is 1. For example:

    ```
    "compression": "gzip;level=4"
    ```

  - `zstd`: Compression level can be set from 1 to 22. Default compression level is 1. For example:

    ```
    "compression": "zstd;level=15"
    ```

  (Bug #36050770)

- A new check is added to the upgrade checker utility, `deprecatedRouterAuthMethod`. This checks for deprecated or invalid authentication methods in use by MySQL Router internal accounts. (Bug #36004507)

- The Upgrade Checker check, `orphanedRoutines`, is renamed `orphanedObjects` and includes support for orphaned events. (Bug #31335863)

- The following options were added to the upgrade checker utility.

  - `include`: comma-separated list of checks to perform.

  - `exclude`: comma-separated list of checks to ignore.

  - `list`: returns a list of all checks which apply to the current configuration.

See Utility Checks. (WL #15974)

- The upgrade check, `partitionsWithPrefixKeys`, is added to the Upgrade Checker utility. This checks for columns with index prefixes as part of a table's partitioning key. This was deprecated in MySQL 8.0.21 and removed in MySQL 8.4. The check is enabled by default for any upgrade from a version prior to MySQL 8.4.0 to MySQL 8.4.0 or higher. (WL #16159)

- The following checks were added to the Upgrade Checker utility:

  - `removedSysVars`: Checks for system variables which are in use in the source but were removed in the target version. Meaning the system variables are set on the source with non-default values.

  - `sysVarsNewDefaults`: Checks for system variables with different default values in the target version.

  - `sysvarAllowedValues`: Checks system variables for valid values.

  - `invalidPrivileges`: Checks for user privileges that will be removed.

  - `pluginUsage`: Checks for deprecated or removed plugins.

  (WL #16135)

Utilities Bugs Fixed

- Under certain circumstances, `util.loadDump()` could fail while executing the final stage, the postamble SQL file. The connection to the server was lost.

  As of this release, if the connection was lost, it is retried. However, statements which are not idempotent are not retried, nor are statements which load data. (Bug #36381849)

- Under certain circumstances, MySQL Shell could close unexpectedly while computing checksum values. (Bug #36323625)

- Improved the performance of the upgrade checker utility on MySQL 5.7 instances containing thousands of schemas and tables. (Bug #36223266)

- Under certain circumstances, a copy operation could stop responding while scanning the target instance for metadata. (Bug #36221818)

- The dump utilities included the MySQL HeatWave Service-reserved username `oracle-cloud-agent` resulting in the following error:

  ```
  User 'oracle-cloud-agent'@'localhost' is using an unsupported
  authentication plugin 'auth_socket' (fix this with 'skip_invalid_accounts' compatibility option)
  ```

  The following users are now excluded when loading to, or dumping from, an MySQL HeatWave Service instance:

  - ocidbm

  - oracle-cloud-agent

  - rrhhuser

  (Bug #36159820)

- Loading a dump on Windows platforms failed if `sql_mode` was set to `STRICT_ALL_TABLES`. The following error was returned:

  ```
  ERROR 1231 (42000): Variable 'wait_timeout' can't be set to the value of '31536000'
  ```

The load utility attempted to set a maximum value for `wait_timeout` which is not permitted on Windows platforms. (Bug #36119568)

- Under certain circumstances dump and load operations could fail with CURL errors `Connection reset by peer`.

  As of this release, the operations are retried in the event of CURL errors `CURLE_SSL_CONNECT_ERROR (35)` and `CURLE_SEND_ERROR (55)`. (Bug #36022084, Bug #36201255)

- When `util.dumpInstance()` was run with `ocimds:true`, the upgrade checker utility ran on the entire instance even if schema or table filtering was enabled on the `util.dumpInstance()` operation.

  As of this release, the upgrade checker utility only runs on the schemas or tables being dumped. (Bug #35891996)

- The upgrade checker utility did not check for the presence of columns partitioned with temporal types which used non-standard temporal delimiters. As a result, the upgrade could fail or tables could be inaccessible after the upgrade. Non-standard delimiters were deprecated in MySQL 8.0.29.

  As of this release, the upgrade checker checks for such delimiters. (Bug #113050, Bug #36004848)

- The upgrade checker utility did not check for all old temporal types. Under certain circumstances, this could result in an upgrade failure. (Bug #112991, Bug #36029331)

Functionality Added or Changed

- MySQL Shell's default mode is changed from `js` (JavaScript) to `sql` in this release.

  > **Note**
  >
  > As of this release, to execute JavaScript code from the command line, you must add the `--js` option to your command. For example:

  ```
  mysqlsh user@host:3306 --js -e "println(session)"
  ```

  (Bug #36348763)

- MySQL Shell's help command (`\help` or `\?`) now supports autocomplete. (Bug #36340752)

- Output for the `thread --locks` report now includes information on metadata locks. Also, information on table handles, mutexes, data locks, and RWlocks was added to the `thread --raw-locks` report. (Bug #36055675)

- The V8 JavaScript engine used by MySQL Shell was updated to version 12.0.267.8. (WL #15948)

Bugs Fixed

- MySQL Shell returned a socket-specific connection message to the localhost although the connection was TCP and to a remote host. This occurred if a socket path was specified either in the configuration file or on the command line.

  As of this release, the transport to use is determined by the right-most parameter on the command line. (Bug #112115, Bug #35751281)