
MySQL NDB Cluster 8.4 Release Notes

Abstract

This document contains release notes for the changes in each release of MySQL NDB Cluster that uses version 8.4 of the [NDB \(NDBCLUSTER\)](#) storage engine.

Each NDB Cluster 8.4 release is based on a mainline MySQL Server release and a particular version of the [NDB](#) storage engine, as shown in the version string returned by executing `SELECT VERSION()` in the `mysql` client, or by executing the `ndb_mgm` client `SHOW` or `STATUS` command; for more information, see [MySQL NDB Cluster 8.4](#).

For general information about features added in NDB Cluster 8.4, see [What is New in MySQL NDB Cluster 8.4](#). For a complete list of all bug fixes and feature changes in MySQL NDB Cluster, please refer to the changelog section for each individual NDB Cluster release.

For additional MySQL 8.4 documentation, see the [MySQL 8.4 Reference Manual](#), which includes an overview of features added in MySQL 8.4 that are not specific to NDB Cluster ([What Is New in MySQL 8.4 since MySQL 8.0](#)), and discussion of upgrade issues that you may encounter for upgrades from MySQL 8.3 to MySQL 8.4 ([Changes in MySQL 8.4](#)). For a complete list of all bug fixes and feature changes made in MySQL 8.4 that are not specific to [NDB](#), see [MySQL 8.4 Release Notes](#).

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.

Document generated on: 2024-05-02 (revision: 28304)

Table of Contents

Preface and Legal Notices	1
Changes in MySQL NDB Cluster 8.4.0 (2024-04-30, LTS Release)	3
Index	7

Preface and Legal Notices

This document contains release notes for the changes in each release of MySQL NDB Cluster that uses version 8.4 of the [NDB](#) storage engine.

Legal Notices

Copyright © 1997, 2024, Oracle and/or its affiliates.

License Restrictions

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

Warranty Disclaimer

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

Restricted Rights Notice

If this is software, software documentation, data (as defined in the Federal Acquisition Regulation), or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software," "commercial computer software documentation," or "limited rights data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

Hazardous Applications Notice

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Trademark Notice

Oracle, Java, MySQL, and NetSuite are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

Third-Party Content, Products, and Services Disclaimer

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

Use of This Documentation

This documentation is NOT distributed under a GPL license. Use of this documentation is subject to the following terms:

You may create a printed copy of this documentation solely for your own personal use. Conversion to other formats is allowed as long as the actual content is not altered or edited in any way. You shall not publish or distribute this documentation in any form or on any media, except if you distribute the documentation in a manner similar to how Oracle disseminates it (that is, electronically for download

on a Web site with the software) or on a CD-ROM or similar medium, provided however that the documentation is disseminated together with the software on the same medium. Any other use, such as any dissemination of printed copies or use of this documentation, in whole or in part, in another publication, requires the prior written consent from an authorized representative of Oracle. Oracle and/or its affiliates reserve any and all rights to this documentation not expressly granted above.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

Access to Oracle Support for Accessibility

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

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

MySQL NDB Cluster 8.4.0 is a new development release of NDB 8.4, based on MySQL Server 8.4 and including features in version 8.4 of the [NDB storage engine](#), as well as fixing recently discovered bugs in previous NDB Cluster releases.

Obtaining MySQL NDB Cluster 8.4. NDB Cluster 8.4 source code and binaries can be obtained from <https://dev.mysql.com/downloads/cluster/>.

For an overview of major changes made in NDB Cluster 8.4, see [What is New in MySQL NDB Cluster 8.4](#).

This release also incorporates all bug fixes and changes made in previous NDB Cluster releases, as well as all bug fixes and feature changes which were added in mainline MySQL 8.4 through MySQL 8.4.0 (see [Changes in MySQL 8.4.0 \(2024-04-30, LTS Release\)](#)).

- [Deprecation and Removal Notes](#)
- [Functionality Added or Changed](#)
- [Bugs Fixed](#)

Deprecation and Removal Notes

- **Packaging; Linux:** Removed the deprecated tool `/usr/bin/pathfix.py` from packages for Fedora 39. (Bug #35997178)
- The unused `INFORMATION_SCHEMA.TABLESPACES` table, deprecated in MySQL 8.0.22, has now been removed.

The Information Schema `FILES` table provides tablespace-related information for [NDB tables](#). (WL #14065)

Functionality Added or Changed

- **Packaging:** Added support for Fedora 40 and Ubuntu 24.04.
- **NDB Replication:** Previously, when SQL nodes performing binary logging had `log_replica_updates=OFF`, replicated updates applied on a replica NDB cluster were still sent to the SQL nodes performing binary logging. Such updates, as well as any updates that do not trigger logging, are no longer sent, in order to decrease network traffic and resource consumption. (WL #15407)

- **ndbinfo Information Database:** Added the `transporter_details` table to the `ndbinfo` information database. This table is similar to the `transporters` table, but provides information about individual transporters rather than in the aggregate.

For more information, see [The ndbinfo transporter_details Table](#). (Bug #113163, Bug #36031560)

- **NDB Client Programs:** Added the `--verbose` option to the `ndb_waiter` test program to control the verbosity level of the output. (Bug #34547034)
- Improved logging related to purging of the binary log, including start and completions times, and whether it is the injector which has initiated the purge. (Bug #36176983)

Bugs Fixed

- **NDB Replication:** Replication of an NDB table stopped under the following conditions:
 - The table had no explicit primary key
 - The table contained `BIT` columns
 - A hash scan was used to find the rows to be updated or deleted

To fix this issue, we now make sure that the hash keys for the table match on the source and the replica. (Bug #34199339)

- **NDB Cluster APIs:** TLS connection errors were printed even though TLS was not specified for connections.

To fix this issue, following an ignored TLS error, we explicitly reset the error condition in the management handle to `NO_ERROR`. (Bug #36354973)

- **NDB Cluster APIs:** The `NdbEventOperation` methods `hasError()` and `clearError()`, long deprecated, are effectively disabled: `hasError()` now returns a constant 0, and `clearError()` does nothing. To determine an event type, use `getEventType2()` instead.
- **NDB Client Programs:** In some cases, it was not possible to load certificates generated using `ndb_sign_keys`. (Bug #36430004)
- **NDB Client Programs:** The following command-line options did not function correctly for the `ndb_redo_log_reader` utility program:

- `--mbyte`
- `--page`
- `--pageindex`

(Bug #36313427)

- **NDB Client Programs:** A certificate lifetime generated by `ndb_sign_keys` should consist of a fixed number of days, plus a random amount of extra time provided by the OpenSSL function `RAND_bytes()`, casting the result to a signed integer value. Because this value could sometimes be negative, this led to extra time being subtracted rather than added.

We eliminate this problem by using an unsigned integer type to hold the value obtained from `RAND_bytes()`. (Bug #36270629)

- **NDB Client Programs:** Invoking `ndb_mgmd` with the `--bind-address` option could in some cases cause the program to terminate unexpectedly. (Bug #36263410)
- **NDB Client Programs:** Some NDB utilities such `ndb_show_tables` leaked memory from API connections when TLS was required by the data nodes, and with valid certificates. (Bug #36170703)

- **NDB Client Programs:** Work begun in NDB 8.0.18 and 8.0.20 to remove the unnecessary text `NDBT_ProgramExit ...` from the output of NDB programs is completed in this release. This message should no longer appear in the release binaries of any such programs. (Bug #36169823)

References: See also: Bug #27096741.

- **NDB Client Programs:** The output from `ndb_waiter --ndb-tls-search-path` was not correctly formatted. (Bug #36132430)
- **NDB Client Programs:** On Windows hosts, `ndb_sign_keys` could not locate the `ssh` program. (Bug #36053948)
- **NDB Client Programs:** `ndb_sign_keys` did not handle the `--CA-tool` option correctly on Windows. (Bug #36053908)
- **NDB Client Programs:** The use of a strict 80-character limit for `clang-format` on the file `CommandInterpreter.cpp` broke the formatting of the interactive help text in the NDB management client. (Bug #36034395)
- **NDB Client Programs:** Trying to start `ndb_mgmd` with `--bind-address=localhost` failed with the error `Illegal bind address`, which was returned from the MGM API when attempting to parse the bind address to split it into host and port parts. `localhost` is now accepted as a valid address in such cases. (Bug #36005903)
- An implicit rollback generated when refusing to discover a table in an ongoing transaction caused the entire transaction to roll back. This could happen when a table definition changed while a transaction was active. We also checked at such times to see whether the table already existed in the data dictionary, which also meant that a subsequent read from same table within the same transaction would (wrongly) allow discovery.

Now in such cases, we skip checking whether or not a given table already exists in the data dictionary; instead, we now always refuse discovery of a table that is altered while a transaction is ongoing and return an error to the user. (Bug #36191370)
- When a backup was restored using `ndb_restore` with `--disable-indexes` and `--restore-privilege-tables`, the ordered index of the primary key was lost on the `mysql.ndb_sql_metadata` table, and could not be rebuilt even with `--rebuild-indexes`. (Bug #36157626)
- `SSL_pending()` data from an SSL-enabled `NdbSocket` was not adequately checked for. (Bug #36076879)
- In certain cases, `ndb_mgmd` hung when attempting to sending a stop signal to `ndbmt.d`. (Bug #36066725)
- Starting a replica to apply changes when NDB was not yet ready or had no yet started led to an unhelpful error message (`Fatal error: Failed to run 'applier_start' hook`). This happened when the replica started and the applier start hook waited for the number of seconds specified by `--ndb-wait-setup` for NDB to become ready; if it was not ready by then, the start hook reported the failure. Now in such cases, we let processing continue, instead, and allow the error to be returned from NDB, which better indicates its true source. (Bug #36054134)
- A `mysqld` process took much longer than expected to shut down when all data nodes were unreachable. (Bug #36052113)
- Negated the need for handling in the NDB binary log injector thread for a failure to instantiate an injector transaction by removing a potential point of failure in that operation. (Bug #36048889)
- It was possible in certain cases for the `TRPMAN` block to operate on transporters outside its own receive thread. (Bug #36028782)
- Removed a possible race condition between `start_clients_thread()` and `update_connections()`, due to both of these seeing the same transporter in the

`DISCONNECTING` state. Now we make sure that disconnection is in fact completed before we set indicating that that the transporter has disconnected, so that `update_connections()` cannot close the `NdbSocket` before it has been completely shut down. (Bug #36009860)

- When a transporter was overloaded, the send thread did not yield to the CPU as expected, instead retrying the transporter repeatedly until reaching the hard-coded 200 microsecond timeout. (Bug #36004838)
- A MySQL server disconnected from schema distribution was unable to set up event operations because the table columns could not be found in the event. This could be made to happen by using `ndb_drop_table` or another means to drop a table directly from `NDB` that had been created using the MySQL server.

We fix this by making sure in such cases that we properly invalidate the `NDB` table definition from the dictionary cache. (Bug #35948153)

- The `ndb_sign_keys` utility's `--remote-openssl` option did not function as expected. (Bug #35853405)
- A replica could not apply a row change while handling a `Table definition changed` error. Now any such error is handled as a temporary error which can be retried multiple times. (Bug #35826145)
- Repeated incomplete incomplete attempts to perform a system restart in some cases left the cluster in a state from which it could not recover without restoring it from backup. (Bug #35801548)
- The event buffer used by the `NDB` API maintains an internal pool of free memory to reduce the interactions with the runtime and operating system, while allowing memory that is no longer needed to be returned for other uses. This free memory is subtracted from the total allocated memory to determine the memory is use which is reported and used for enforcing buffer limits and other purposes; this was represented using a 32-bit value, so that if it exceeded 4 GB, the value wrapped, and the amount of free memory appeared to be reduced. This had potentially adverse effects on event buffer memory release to the runtime and OS, free memory reporting, and memory limit handling.

This is fixed by using a 64-bit value to represent the amount of pooled free memory. (Bug #35483764)

References: See also: Bug #35655162, Bug #35663761.

- `START REPLICHA`, `STOP REPLICHA`, and `RESET REPLICHA` statements are now written to `mysqld.log`. (Bug #35207235)
- `NDB` transporter handling in `mt.cpp` differentiated between neighbor transporters carrying signals between nodes in the same node group, and all other transporters. This sometimes led to issues with multiple transporters when a transporter connected nodes that were neighbors with nodes that were not. (Bug #33800633)
- Removed unnecessary warnings generated by transient disconnections of data nodes during restore operations. (Bug #33144487)
- During setup of utility tables, the schema event handler sometimes hung waiting for the global schema lock (GSL) to become available. This could happen when the physical tables had been dropped from the cluster, or when the connection was lost for some other reason. Now we use a try lock when attempting to acquire the GSL in such cases, thus causing another setup check attempt to be made at a later time if the global schema lock is not available. (Bug #32550019, Bug #35949017)
- API nodes did not record any information in the log relating to disconnects due to missed heartbeats from the data nodes. (Bug #29623286)

Index

B

binary log injector, 3
bind address, 3
BIT, 3

D

disable-indexes, 3

E

error handling, 3
EventBuffer, 3

F

free memory, 3

G

global schema lock, 3

H

hash scan, 3
heartbeats, 3
help text, 3

I

INFORMATION_SCHEMA, 3

L

Linux, 3
logs, 3
log_replica, 3

M

mysqld, 3

N

NDB Client Programs, 3
NDB Cluster, 3
NDB Cluster APIs, 3
NDB Replication, 3
ndb-wait-setup, 3
NdbEventOperation, 3
ndbinfo Information Database, 3
ndb_mgmd, 3
ndb_redo_log_reader, 3
ndb_sign_keys, 3
ndb_waiter, 3
neighbor nodes, 3

P

Packaging, 3

S

schema distribution, 3

send threads, 3
sockets, 3
SSL, 3
STOP, 3

T

TABLESPACES table, 3
TLS, 3
transactions, 3
transporters, 3
transporter_details, 3
TRPMAN, 3

W

warnings, 3