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Upcoming Changes in MySQL 5.7

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Almost 4 Years of MySQL Innovation

MySQL Cluster 7.3

MySQL Workbench 6.0

MySQL Migration Wizard

MySQL 5.6

MySQL 5.5

Windows installer & Tools

MySQL 5.7

MySQL Cluster Manager

MySQL Enterprise Monitor 2.3 & 3.0

MySQL Applier for Hadoop

MySQL Enterprise

Backup

Security

Scalability

HA

Audit

MySQL Utilities

MySQL Workbench 5.2 & 6.0

MySQL Cluster 7.2

MySQL Cluster 7.1

MySQL Enterprise Oracle Certifications

MySQL 5.7

- Absolutely amazing things are coming!
  - Performance Improvements with InnoDB.
  - MDL, Transactions and memory instrumentation with Performance Schema.
  - Many more…
- New features won't be the focus of this talk.

Subject of this talk

- Oracle is committed to MySQL's long term success.
- Prepared to do the heavy lifting required to improve the overall server architecture.
- This talk is about:

Sharing our ideas.
Providing you an opportunity for feedback.
Trying to make the transition as smooth as possible.

Photo Credit:
http://www.flickr.com/photos/magnusvk

MySQL 5.7 (cont.)

- Breakage is *painful.*
- It is important to:
  - be as careful as possible
  - provide as much notice as possible.
  - communicate *why* change is required.

Ways to ~~coerce~~ steer users in the right direction

1. Change the default to use desired behaviour.
2. Issue warning about feature deprecation.
3. Remove feature.

Situation dependent.
MySQL 5.7 employs all 3 techniques.

"**Deprecation** is a status applied to a computer software feature, characteristic, or practice indicating it should be avoided, typically because it is being superseded."

http://en.wikipedia.org/wiki/Deprecation

Deprecation

- Will understandably upset users.
- However, it is not the same as removal.
- Good stewardship to define an “officially supported method” when >1 exist.

The Main Event

- These are the potential changes we have asked for feedback on. All appear at: http://www.tocker.ca/categories/community/

- Very important! Being listed here does not guarantee any change will be made.

Changes to Replication Defaults

- MySQL 5.6 improved durable replication performance considerably (group commit fix)
- Proposal is to make replication durable by default starting from 5.7:
  - sync_binlog = 1
  - master-info-repository = TABLE
  - relay-log-info-repository = TABLE

SHOW ENGINE INNODB MUTEX

```
mysql> show engine innodb mutex;
+--------+-----------------------------+-------------------+
| Type   | Name                        | Status            |
+--------+-----------------------------+-------------------+
| InnoDB | log/log0log.c:775           | os_waits=26       |
| InnoDB | log/log0log.c:771           | os_waits=1        |
| InnoDB | buf/buf0buf.c:1208          | os_waits=3219     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=6990     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=4619     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=5627     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=7873     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=4466     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=16929    |
| InnoDB | buf/buf0buf.c:1208          | os_waits=19305    |
| InnoDB | buf/buf0buf.c:1208          | os_waits=16301962 |
| InnoDB | buf/buf0buf.c:1208          | os_waits=11649    |
| InnoDB | buf/buf0buf.c:1208          | os_waits=950471   |
| InnoDB | buf/buf0buf.c:1208          | os_waits=6545     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=4262     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=5642     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=7878     |
| InnoDB | buf/buf0buf.c:1208          | os_waits=387166   |
| InnoDB | fil/fil0fil.c:1559          | os_waits=1265     |
| InnoDB | srv/srv0srv.c:987           | os_waits=460452   |
| InnoDB | combined buf/buf0buf.c:900  | os_waits=38503    |
| InnoDB | log/log0log.c:832           | os_waits=184      |
| InnoDB | combined buf/buf0buf.c:901  | os_waits=77       |
+--------+-----------------------------+-------------------+
23 rows in set (0.56 sec)
```

SHOW ENGINE INNODB MUTEX (cont.)

- Overlaps with Performance Schema.
- **Proposal in MySQL 5.7:**
  - To be deprecated.
  - We want to be able to ‘pick a favourite’ in order to keep user experience consistent.

InnoDB Monitor tables

- Existed in a time when information_schema did not. Usage was:

```
CREATE TABLE innodb_monitor (a INT) ENGINE=INNODB;

/* view to the error log */

DROP TABLE innodb_monitor;
```

InnoDB Monitor tables (cont.)

- **5.7 Proposal:**
- innodb_monitor. To be replaced with SET GLOBAL innodb_monitor=ON|OFF.
- innodb_lock_monitor. To be replaced with SET GLOBAL innodb_lock_monitor=ON|OFF.
- innodb_tablespace_monitor. To be removed. information_schema will become the recommended alternative.
- innodb_table_monitor. To be removed. information_schema will become the recommended alternative.
- innodb_mem_validate. To be removed. This depends on UNIV_MEM_DEBUG, which is not normally enabled even in debug builds.

ALTER IGNORE TABLE

- Useful for adding PRIMARY/UNIQUE keys on tables with duplicate keys.
  - Will silently drop rows for you!
- Has strange semantics for replication and ALTER TABLE.

ALTER IGNORE TABLE (cont.)

- **Proposal went ahead already:**
  - Deprecated in 5.6.17.
  - Removed in 5.7 DMR4

Simplify SQL_MODE options

- Proposal is to reduce the number of mode options available.
- Aim is to increase usage of SQL_MODE options, encourage more users to run MySQL in a stricter way.

Simplify SQL_MODE options (cont.)

- **Current recommendation:**
  sql-mode="STRICT_TRANS_TABLES,
  ERROR_FOR_DIVISION_BY_ZERO,
  NO_AUTO_CREATE_USER,
  NO_AUTO_VALUE_ON_ZERO,
  NO_ENGINE_SUBSTITUTION, NO_ZERO_DATE,
  NO_ZERO_IN_DATE,ONLY_FULL_GROUP_BY"

Simplify SQL_MODE options (cont.)

- **5.7 Proposal:**
- Remove the options ERROR_FOR_DIVISION_BY_ZERO, NO_ZERO_DATE and NO_ZERO_IN_DATE.
- These behaviours be enabled by STRICT_TRANS_TABLES or STRICT_ALL_TABLES.
- Improve error reporting when a behaviour is influenced by an SQL mode.

Enable Only Full Group By SQL_MODE

```
mysql> SELECT id, invoice_id, description
FROM invoice_line_items GROUP BY invoice_id;
+----+------------+-------------+
| id | invoice_id | description |
+----+------------+-------------+
|  1 |          1 | New socks   |
|  3 |          2 | Shoes       |
|  5 |          3 | Tie         |
+----+------------+-------------+
3 rows in set (0.00 sec)
```

Only Full Group By (cont.)

- Proposal is to by default product an error from MySQL 5.7.
- Will still be configurable via SQL MODE only_full_group_by.

```
mysql> SELECT id, invoice_id, description
FROM invoice_line_items GROUP BY invoice_id;
ERROR 1055 (42000): 'test.invoice_line_items.id' isn't in GROUP BY
```

EXPLAIN PARTITIONS and EXPLAIN EXTENDED deprecation

```
mysql> EXPLAIN SELECT * FROM table_a\G
*************************** 1. row ***************************
           id: 1
  select_type: PRIMARY
        table: table_a
   partitions: NULL
         type: ALL
possible_keys: NULL
          key: NULL
      key_len: NULL
          ref: NULL
         rows: 3
     filtered: 100.00
        Extra: NULL
2 rows in set, 1 warning (0.00 sec)
```

EXPLAIN PARTITIONS and EXPLAIN EXTENDED deprecation

- Motivated by Internal Code Cleanup
- Two optional flags that only add value - no reason other than automated tooling format preferences not to enable them.

EXPLAIN PARTITIONS and EXPLAIN EXTENDED deprecation (cont.)

- **Proposal:**
- Enables two flags by default, and deprecates the use of the extended syntax.
- Went ahead in 5.7 DMR3.

Deprecation of NULL synonym \N

```
mysql> SELECT NULL is \N;
+------------+
| NULL is \N |
+------------+
|          1 |
+------------+
1 row in set (0.00 sec)

mysql> INSERT INTO tablea VALUES (3, \N);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM tablea WHERE b IS \N;
+---+------+
| a | b    |
+---+------+
| 3 | NULL |
+---+------+
1 row in set (0.00 sec)
```

Deprecation of NULL synonym \N (cont.)

- **Proposal:**
- For removal in either 5.7 or 5.8.
- Still seeking feedback.

Query Cache

- Defaults to DISABLED in 5.6.
- We have “ideas but not plans” for future improvements.

Federated Storage Engine

- Users encouraged to use Multi-source replication over Federated Storage Engine.
- We are seeking feedback for use cases for Federated.

MyISAM Merge

- Similar to Partitioning but MyISAM Only.
  - Does not offer partition pruning.
- Major limitation was partition exchange - introduced in 5.6.
- Will blog seeking remaining use cases for MERGE storage engine very soon.

Last Comment

- All of these items have been blogged about here: http://www.tocker.ca/categories/community/


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