Why we’re excited about MySQL 8
Practical Look for Devs and Ops

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FOSDEM
In the Presentation

Practical view on MySQL 8

Exciting things for Devs

Exciting things for Ops
Warning

This assessment is done for Pre-GA MySQL 8, based on documentation and limited testing. We’re yet to see how they behave in production.
Examples liberally borrowed from Oracle team presentations and Blog Posts
MySQL 8 for Ops
Ops care about

- Stability
- High Availability
- Performance
- Security
- Observability
- Manageability
Native Data Dictionary

About 10 years overdue

Atomic, Crash Save, DDLs

Much Faster Information Schema

No more MyISAM System Tables!
Fast Information Schema

```
1 SELECT t.table_schema, t.table_name, c.column_name
2 FROM information_schema.tables t,
3     information_schema.columns c
4 WHERE t.table_schema = c.table_schema
5     AND t.table_name = c.table_name
6     AND t.engine='InnoDB';
```

Scaling from 5,000 to 1,000,000 tables
Much Better and Faster UTF8

- utf8mb4 as Default Charset
Security

ROLEs

Breakdown of SUPER Privileges

Password History

Faster cached-SHA2 Authentication (Default)

Community Builds use OpenSSL

--skip-grants blocks remote connections

Redo and Undo Logs are now encrypted if Table Encryption is enabled
Persistent Auto Increment

Another feature 10 years overdue

Do not reset AUTO INCREMENT to the max value in the table on restart
Auto-Managed Undo Tablespace

Do not use system table space for undo space any more

Automatically reclaim space on disk from large transactions
Self Tuning (limited to Innodb)

Set `innodb_dedicated_server` to auto-tune

- `innodb_buffer_pool_size`
- `innodb_log_file_size`
- `innodb_flush_method`
Partial In-Place Update for JSON

Can update field in JSON object without full re-write

Great for counters, statuses, timestamps etc

Only update and removal of element is supported

Innodb Support Added as of MySQL 8.0.4
Invisible Indexes

- Test impact of dropping indexes before actually dropping them
- Can use `use_invisible_index`es to use invisible indexes in a session

```sql
CREATE TABLE t1 (  
  i INT,  
  j INT,  
  k INT,  
  INDEX i_idx (i) INVISIBLE  
) ENGINE = InnoDB;

CREATE INDEX j_idx ON t1 (j) INVISIBLE;

ALTER TABLE t1 ADD INDEX k_idx (k) INVISIBLE;
```
TmpTable Storage Engine

More efficient storage engine for Internal Temporary tables

Efficient storage for VARCHAR and VARBINARY columns

BLOB/TEXT Columns are not supported (yet?)
Backup Locks

Prevent operation which may result in inconsistent backups

LOCK INSTANCE FOR BACKUP
Optimizer Histograms

• Detailed Statistics on Columns, not just Indexes

```json
{
    "buckets": [
        [
            1,
            0.3333333333333333
        ],
        [
            2,
            0.6666666666666667
        ],
        [3,
            1
        ],
        "null-values": 0,
        "last-updated": "2017-03-24 13:32:40.000000",
        "sampling-rate": 1,
        "histogram-type": "singleton",
        "number-of-buckets-specified": 128,
        "data-type": "int",
        "collation-id": 8
    ]
}
```
Improved Optimizer Cost Model

Keep in account how much of data is cached vs on disk

More on MySQL 8 Optimizer

http://www.unofficialmysqlguide.com/
Performance Schema

(Fake) Indexes for Faster Access

Error Instrumentation

Response Time Histograms (Global and Per Query Digest)

Query Examples for Summary by Digest
Performance Schema Performance

- Now is Interactively Usable at Scale

Performance Comparison

SELECT * FROM sys.session
1000 active sessions

Query Time
0 10 20 30 40

Over 30x faster!

MySQL 8.0
MySQL 5.7
Remote Management Features

```
RESTART (Command)

SET PERSIST innodb_buffer_pool_size = 1024 * 1024 * 1024;
```
Assumes storage is SSD by Default

Start of the long journey
Binary Log On by Default

- `bin_log` is enabled by default
- `log_slave_updates` is enabled by default
- Expire logs after 30 days by default
Query Cache Removed

It’s design caused more problems than it fixed

Use ProxySQL (or other) external query cache instead
Native Partitioning Only

Only “Native” Partitioning supported, not Generic One

Remove partitions from MyISAM partitioned tables or convert them

ALTER TABLE ... REMOVE PARTITIONING

ALTER TABLE ... ENGINE=INNODB
Resource Groups

• Isolation and Better Performance

MySQL 8.0 Resource Groups - 100% Faster
Plain Better Performance at Scale

Sysbench: OLTP_RO Point-Selects

- 2.1x Faster than MySQL 5.7
- 2.8x Faster than MySQL 5.6
MySQL 8 will allow us to make Percona Monitoring and Management even Better!
Feature Requests

Better Single Thread Performance

Parallel Single Query Processing
Please
Sorry state of MySQL single thread performance

http://bit.ly/2oMvu2a

QPS for point-query

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Thank You!