

Best Practices for a smooth upgrade from MySQL 5.7 to 8



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About me

- BSc and MSc in computer science
- 15 years of working experience as a Systems and databases administrator
- Joined Percona in May 2017
- Now working as a Principal DBA



Agenda

- New features in MySQL/Percona Server for MySQL 8
- What has changed? / Removed
- Upgrade Strategies



Why do we need to upgrade?

- New features
 - Optimizations
 - Bug fixes
 - Support
- Performance
 - Compliance
 - Potential risks
 - New use cases



What if i can't
upgrade ?

You should upgrade ASAP but if you cannot for any reason you can consider post EOL-Support

<https://www.percona.com/post-mysql-5-7-eol-support>

Eligibility for Percona software for MySQL 5.7 only

- Percona Server for MySQL 5.7 / Percona XtraDB Cluster 5.7
- Percona XtraBackup 2.4

No extended support for MySQL 5.7. Enterprise Edition -> If you use Enterprise Edition, you should switch to Percona Server for MySQL 5.7



(Some) New features / Changes

- Data Dictionary changes
- Atomic DDL
- SHA256 Passwords
- Roles
- Relocating InnoDB Tables
- JSON Improvements
- Temporary Tables
- Password Expiration and Reuse
- Dynamic Privileges
- Resource Groups
- InnoDB Improvements
- Instant ALTER TABLE
- Invisible Indexes and Primary Key
- Descending Indexes
- Common Table Expressions
- Recursive CTE
- Replication with Write-Sets
- Window Functions
- Using SET_VAR
- GeoSpatial Improvements
- RENAME COLUMN
- RESTART



Data Dictionary

- Transactional data dictionary
- .frm, .par, .TRN, .TRG, .isl, db.opt - All gone!
- Implemented in mysql.ibd
- information_schema tables are now simply views



Atomic DDL

- Combines DDL, storage engine operations and binary log writes.
- DDLs are committed or rolled back.
- Supported for several operations
- Different behaviour on 5.7. Be aware 5.7 (M) -> 8.0 (S) replication

i.e.: `DROP TABLE t1, t2;`



SHA256 Passwords

- `caching_sha2_password` is the default in 8.0
- upgrade `libmysqlclient`
- `caching_sha2_password` can be use in 5.7
- `PASSWORD()` function removed



Roles

- A named collection of privileges
- Mandatory roles



Relocating InnoDB Tables

- innodb_directories: Defines a list of directories to scan at startup for tablespace files
- Other %_dir are included
- Keep the format <schema>/<table>.ibd



JSON Improvements

- In 8.0 "last duplicate key wins" but in 5.7 "first wins"



Temporary Tables

- New TempTable storage engine
- temptable_max_ram = 1GB (Default)



Changes and some features that have been removed

- Replication Warning
- Renamed I_S Views
- Users and Privileges
- Query Cache: REMOVED!
- Variables renamed or removed
- New defaults on several variables
- Changes on Performance Schema
- Changes on Replication



Things to consider

- Decide the strategy: In place (supported) or new server
- **Confirm that you have working backups that can be restored**
- Create a Rollback plan
- **Test the upgrade path**
- Use the Upgrade Checker Utility / Manual
- Test your application against targeted version. [pt-upgrade](#) can help



Upgrade strategies quick comparison

In Place

- No extra costs for hardware
- Same OS version
- Hard downtime during upgrade
- No need for cutover
- Harder to test
- Harder to rollback
- Testing will be restricted

Migration

- New server means more €
- Possible OS upgrade
- Server is build before
- You will need to cutover
- Easiest to rollback
- Fully tested procedure



In place

- Verify if the .cnf has to be adjusted i.e. config variables that have been removed
- Upgrade binaries
- Run mysql_upgrade, if running < 8.0.16
- Downtime required or promote replica
- Small environment / low traffic / non critical
- Rollback (aka: downgrade) not possible. Use backup.



New server - Migration

- Build a new environment . Either stream a backup and in-place upgrade or logically dump/restore
- Keep new environment synced using replication
- Test your application against new environment i.e. compatibility, performance
- Define the cutover procedure and the rollback plan
- Remember that replication from 8.0->5.7 is not supported but *possible*.



Questions ?





Thank you!

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