How to backup and recovery in MySQL

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Glossary

- Backup. (The process of copying some or all table data and metadata from a MySQL instance, for safekeeping)

- Binary log. (A file containing a record of all statements that attempt to change table data)

- Redo log. (A disk-based data structure used during crash recovery, to correct data written by incomplete transactions)

Backup

- Logical (mysqldump)

- Physical (copy raw directories and files, mysqlbackup)

Note: lock before copying raw.

Comparison

	Speed	Output	Flexible	Compatibility
Logical	slower	larger	yes	easy
Physical	faster	compact	no	hard

Recovery

- Full

- Incremental (Point-in-Time)

- Get current binary log file. (show master status)

- Get sql statements. (mysqlbinlog bin.log)

- Import to MySQL server. (mysql < update.sql)

Replication

- Backup

- Point in time recovery

Three Threads Group

| Master binary log dump thread | ← | Slave I/O thread | ← | Slave SQL thread |

Note: every master/slave replication group has this three threads.

Setup

- Select master server id

- Enable log_bin variable

- Create a replication user on master

- Select slave server id

- Get binary log coordinates on master

- Set master configuration on slave

Formats

- Row

- Statement

- Mixed

Comparison

	Speed	Safety	Concurrency
Row	slow	safest	higher
Statement	fast	non safest	lower

Recovery in Aliyun RDS

- Clone a RDS instance

- Get correct data

- Migrate with Aliyun DTS

How to Clone

- Specific backup files

- Specific point-in-time

How about losing one second transactions

The accuracy of MySQL binary log record timestamp is second.

Hack: find Table_map BINLOG statement in file header and execute operation BINLOG statement.

Corruption Conditions

- DROP TABLE

- DROP DATABASE

- DELETE (include TRUNCATE TABLE)

Operation Comparison

	Recovery	Speed	Inconsistence
DROP TABLE	easy	depend on table size	no
DROP DATABASE	normal	depend on database size	no
DELETE	hard	slow	yes

References

- https://dev.mysql.com/doc/refman/5.6/en/glossary.html#glos_backup

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