

Table of Contents

Introduction	1.1
0.	1.2
0.1 dble	1.2.1
0.2 dbleMyCat	1.2.2
0.3	1.2.3
0.3.1 docker	1.2.3.1
0.3.2 docker-compose	1.2.3.2
0.4	1.2.4
1.	1.3
1.1 cluster.cnf	1.3.1
1.2 bootstrap.cnf	1.3.2
1.3 user.xml	1.3.3
1.4 db.xml	1.3.4
1.5 sharding.xml	1.3.5
1.6 log4j2.xml	1.3.6
1.7	1.3.7
1.7.1 MySQL offset-step	1.3.7.1
1.7.2 (Snowflake)	1.3.7.2
1.7.3 (Snowflake)	1.3.7.3
1.7.4 offset-step	1.3.7.4
1.8 cache	1.3.8
1.8.1 cache	1.3.8.1
1.8.2 ehcache	1.3.8.2
1.9	1.3.9
1.10	1.3.10
1.11	1.3.11
1.12	1.3.12
1.13 Schema	1.3.13
2.	1.4
2.0	1.4.1
2.0.1 dble_config	1.4.1.1
2.1	1.4.2
2.1.1 select	1.4.2.1
2.1.2 set	1.4.2.2
2.1.3 show	1.4.2.3
2.1.4 switch	1.4.2.4
2.1.5 kill	1.4.2.5
2.1.6 stop	1.4.2.6
2.1.7 reload	1.4.2.7
2.1.8 rollback	1.4.2.8
2.1.9 offline	1.4.2.9
2.1.10 online	1.4.2.10
2.1.11 file	1.4.2.11
2.1.12 log	1.4.2.12
2.1.13	1.4.2.13
2.1.14 pause & resume	1.4.2.14
2.1.15	1.4.2.15
2.1.16 /	1.4.2.16
2.1.17 check @@metadata	1.4.2.17
2.1.18 release @@metadata	1.4.2.18
2.1.19 split	1.4.2.19
2.1.20 flow_control	1.4.2.20

2.1.21	1.4.2.21
2.1.22	1.4.2.22
2.2	1.4.3
2.2.1 MySQL offset-step	1.4.3.1
2.2.2	1.4.3.2
2.2.3	1.4.3.3
2.2.4 offset-step	1.4.3.4
2.3	1.4.4
2.4	1.4.5
2.5	1.4.6
2.5.1 XA	1.4.6.1
2.5.2 XA	1.4.6.2
2.5.3 XA	1.4.6.3
2.5.4 XA	1.4.6.4
2.5.5	1.4.6.5
2.5.6 XA	1.4.6.6
2.6	1.4.7
2.7	1.4.8
2.8 &	1.4.9
2.9 grpc	1.4.10
2.10 meta	1.4.11
2.10.1 Meta	1.4.11.1
2.10.2 Meta	1.4.11.2
2.10.3	1.4.11.3
2.10.4 View Meta	1.4.11.4
2.11	1.4.12
2.11.1	1.4.12.1
2.11.2	1.4.12.2
2.11.3	1.4.12.3
2.11.4	1.4.12.4
2.11.5 heartbeat	1.4.12.5
2.11.6	1.4.12.6
2.11.7 sql	1.4.12.7
2.12	1.4.13
2.13	1.4.14
2.14 ER	1.4.15
2.15 global	1.4.16
2.16	1.4.17
2.17	1.4.18
2.18	1.4.19
2.19 reload	1.4.20
2.20	1.4.21
2.21 SQLtrace	1.4.22
2.22 KILL @@DDL_LOCK	1.4.23
2.23	1.4.24
2.23.1 MYSQL-HA	1.4.24.1
2.23.2	1.4.24.2
2.23.3	1.4.24.3
2.23.4 HA	1.4.24.4
2.24	1.4.25
2.25	1.4.26
2.26 client_found_rows	1.4.27
2.27 general	1.4.28
2.28 sql	1.4.29
2.29 load data	1.4.30

2.30 injoin	1.4.31
2.31 DDL	1.4.32
2.32	1.4.33
2.33 hint	1.4.34
2.34	1.4.35
2.34.1 SSL	1.4.35.1
2.34.2 DBLESSL	1.4.35.2
2.35	1.4.36
2.36	1.4.37
2.37	1.4.38
2.38 tcp	1.4.39
2.39 HTAP	1.4.40
2.40 dble(printkillrecover)	1.4.41
3.	1.5
3.1 DDL	1.5.1
3.1.1 DDL&Table Syntax	1.5.1.1
3.1.2 DDL&View Syntax	1.5.1.2
3.1.3 DDL&Index Syntax	1.5.1.3
3.1.4 DDL	1.5.1.4
3.1.5 DDL&Database_Syntax	1.5.1.5
3.1.6 ONLINE DDL	1.5.1.6
3.2 DML	1.5.2
3.2.1 INSERT	1.5.2.1
3.2.2 REPLACE	1.5.2.2
3.2.3 DELETE	1.5.2.3
3.2.4 UPDATE	1.5.2.4
3.2.5 SELECT	1.5.2.5
3.2.6 SELECT JOIN syntax	1.5.2.6
3.2.7 SELECT UNION Syntax	1.5.2.7
3.2.8 SELECT Subquery Syntax	1.5.2.8
3.2.9 LOAD DATA	1.5.2.9
3.2.10 DML	1.5.2.10
3.3 Prepared SQL Syntax	1.5.3
3.4 Transactional, Savepoint and Locking Statements	1.5.4
3.4.1	1.5.4.1
3.4.2	1.5.4.2
3.4.3 SAVEPOINT	1.5.4.3
3.4.4 Lock&unlock	1.5.4.4
3.4.5 SET TRANSACTION Syntax	1.5.4.5
3.4.6 XA	1.5.4.6
3.4.7	1.5.4.7
3.5 DAL	1.5.5
3.5.1 SET	1.5.5.1
3.5.2 SHOW	1.5.5.2
3.5.3 KILL	1.5.5.3
3.5.4 DAL	1.5.5.4
3.6	1.5.6
3.7 Utility Statements	1.5.7
3.8 Hint	1.5.8
3.9	1.5.9
3.10 (alpha)	1.5.10
3.11	1.5.11
4.	1.6
4.1	1.6.1
4.2	1.6.2

4.3	1.6.3
4.4 (Prepared Statements)	1.6.4
4.5	1.6.5
5.	1.7
5.1 druid	1.7.1
5.2	1.7.2
6.MySQL Server	1.8
6.1	1.8.1
6.2 INSERT	1.8.2
6.3 "show all tables"	1.8.3
6.4 message	1.8.4
6.5 information_schema	1.8.5
7.	1.9
7.1 SQL	1.9.1
7.2 dbleDemo	1.9.2
7.3	1.9.3
8.	1.10
8.1	1.10.1
8.2 MySQL-offset-step	1.10.2
9.sysbenchdbe	1.11
9.1	1.11.1
9.2 dble	1.11.2
9.3 sysbench	1.11.3
A.Faq	1.12
A.1 ErrorCode	1.12.1
max Connections	1.12.1.1
Out Of Memory Error	1.12.1.2
The Problem Of Hint	1.12.1.3
NestLoop Parameters Lead To Temptable Exception	1.12.1.4
Can't Get Variables From ShardingNode	1.12.1.5
Port already in use:1984	1.12.1.6
Sharding Column Cannot Be Null	1.12.1.7
A.2	1.12.2
How To Use Explain To Resolve The Distribution Rules Of Group Gy	1.12.2.1
Hash And ConsistentHashing And Jumpstringhash	1.12.2.2
A.3	1.12.3
ToBeContinued2	1.12.3.1

dble

3.23.08.xdbletagrelease

gitbook SUMMARY.md

github

PDF

[Release](#)

dble

- [github: github.com/actiontech/dble](#)
- [github: github.com/actiontech/dble-test-suite](#)
- [github: github.com/actiontech/dble-docs-cn](#)
- [github pages: actiontech.github.io/dble-docs-cn](#)
- [DBLE](#)
- QQ group: 669663113
-



dble

dble :

- : 400-820-6580
- : 86-13910506562,
- : 86-18503063188,
- : 86-18930110869,
- : 86-13540040119,

0

- [0.1 dble](#)
- [0.2 dbleMyCat](#)
- [0.3
 - \[0.3.1 docker\]\(#\)
 - \[0.3.2 docker-compose\]\(#\)](#)
- [0.4](#)

0.1 dble

0.1.1 dble

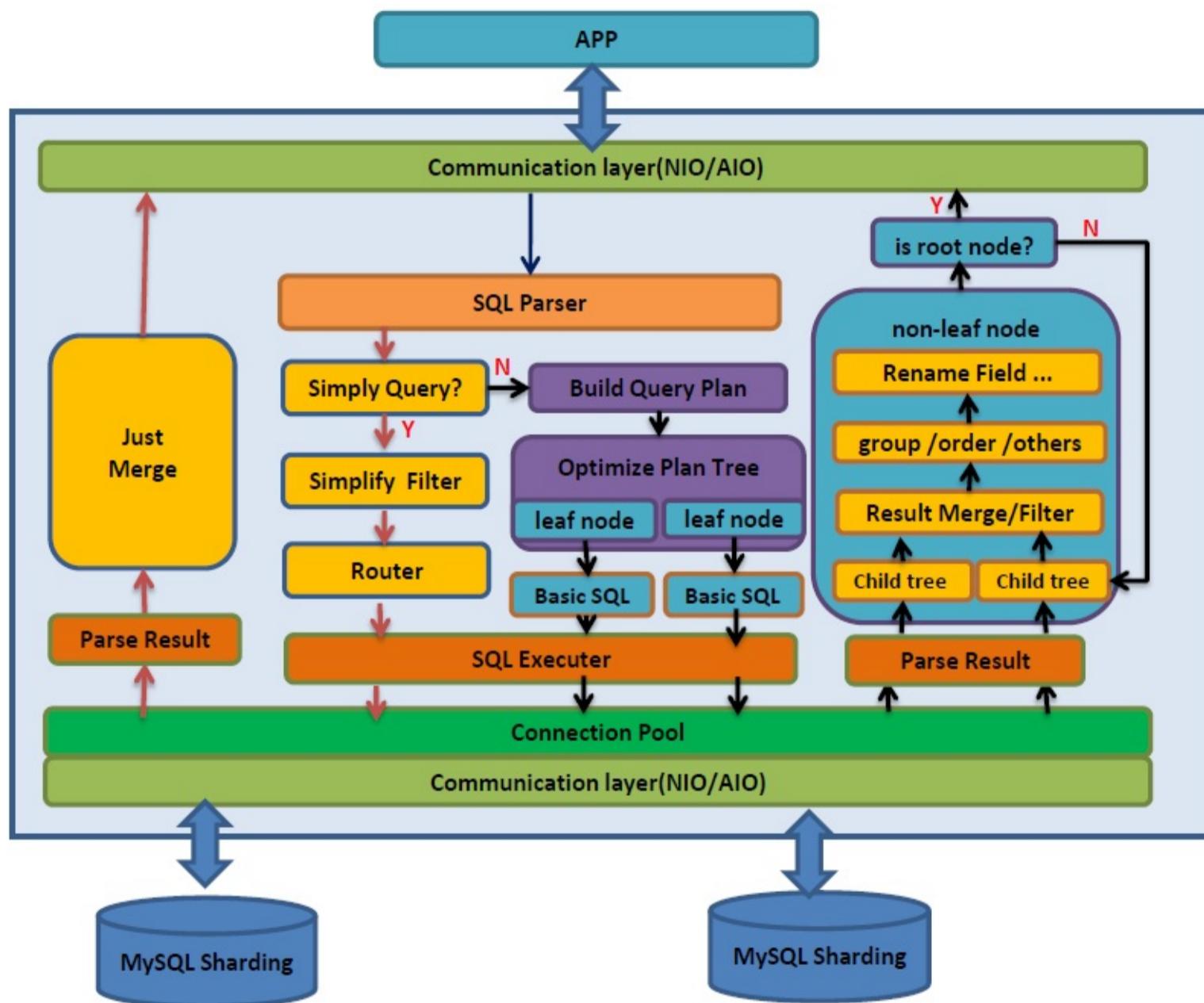
dbleMySQL

- dbleMySQL
- MySQL MySQLMySQL
- dble
- SQL SQL 92MySQLSQLgroup byorder bydistinctjoinunionsub-query
- ER
- XAXAMySQL-5.7XA TransactionMySQL

0.1.2 dble

- dble MyCatMyCat
- MySQL / bugs [dbleMyCat](#)

0.1.3 dble



0.2 dbleMyCat

dble

0.2.1 mycatmycatbug

- “double free”JVM #4
- XA #21
- wherewhereselect * from customer wher id=1; #126
- insert into table values(1)(2)mycatSQL
- sql #92
- / #43,#31,#44
- between A and Bhash #23
- alter tableinsert...on duplicate...update...in () #24, #25,#26 ,#5
- #1
- ER, #13
- sharding-join#17

0.2.2

- SQLcreate table if not exists...alter table add/drop [primary] key...
- IO: dbleIO 2
- #56
- - ZK
 - ZK ID
 - #489
 - - insert into table1(id,name) values(next value for MYCATSEQ_GLOBAL,’test’);
 - 1insert into table1(name) values(‘test’);
 - 2insert into table1 values(‘test’);
 - bigint
- ERER
- ERER
- schemacheckSQLschema
- conf/index_to_charset.properties
-
- SQLUPDATE/DELETE/INSERT

0.2.3

- ShareJoin(join,union,subquery)/
- showdescolumnsinsert #7
- -
 -
- SQL
 - mysql> explain select * from sharding_two_node a inner join sharding_four_node b on a.id =b.id;

```
+-----+-----+
| SHARDING_NODE | TYPE      | SQL/REF           |
+-----+-----+
| dn1.0         | BASE SQL | select `a`.`id`, `a`.`c_char`, `a`.`ts`, `a`.`si` from `sharding_two_node` `a` ORDER BY `a`.`id` ASC |
| dn2.0         | BASE SQL | select `a`.`id`, `a`.`c_char`, `a`.`ts`, `a`.`si` from `sharding_two_node` `a` ORDER BY `a`.`id` ASC |
| dn1.1         | BASE SQL | select `b`.`id`, `b`.`c_flag`, `b`.`c_decimal` from `sharding_four_node` `b` ORDER BY `b`.`id` ASC |
| dn2.1         | BASE SQL | select `b`.`id`, `b`.`c_flag`, `b`.`c_decimal` from `sharding_four_node` `b` ORDER BY `b`.`id` ASC |
| dn3.0         | BASE SQL | select `b`.`id`, `b`.`c_flag`, `b`.`c_decimal` from `sharding_four_node` `b` ORDER BY `b`.`id` ASC |
| dn4.0         | BASE SQL | select `b`.`id`, `b`.`c_flag`, `b`.`c_decimal` from `sharding_four_node` `b` ORDER BY `b`.`id` ASC |
| merge.1       | MERGE    | dn1.0, dn2.0      |
| merge.2       | MERGE    | dn1.1, dn2.1, dn3.0, dn4.0 |
| join.1        | JOIN     | merge.1, merge.2 |
+-----+-----+
9 rows in set (0.00 sec)
```

- set

- set charset/names
- :XA
-
- DUAL
- (,CC++)
-
- Druid,
- fastjson,
- [reload](#)
- MySQLGUI/Driver
- ,
- RocksDB
- mysqldumpslow pt-query-digest
- [Trace](#)
- MySQL
- [Prepared SQL Statement Syntax](#)
- - The Subquery as Scalar Operand
 - Comparisons Using Subqueries
 - Subqueries with ANY, IN, or SOME
 - Subqueries with ALL
 - Subqueries with EXISTS or NOT EXISTS
 - Derived Tables (Subqueries in the FROM Clause)
- dble [View](#)
- MySQL8.0
-
-
-
- DDL
-
-

0.2.4

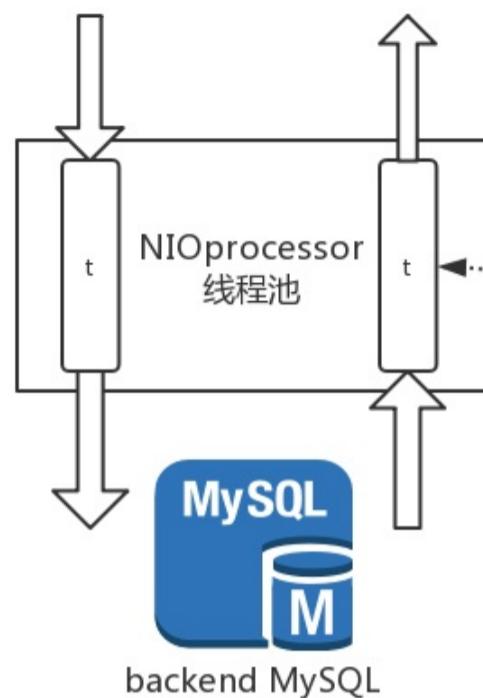
- HASH
-
- set
-
- writeTypewriteType = 1
- handleDistributedTransactions

0.2.5

[DBLEMyCAT](#)

0.2.6 2

Mycat以及dble 2.18.02之前版本

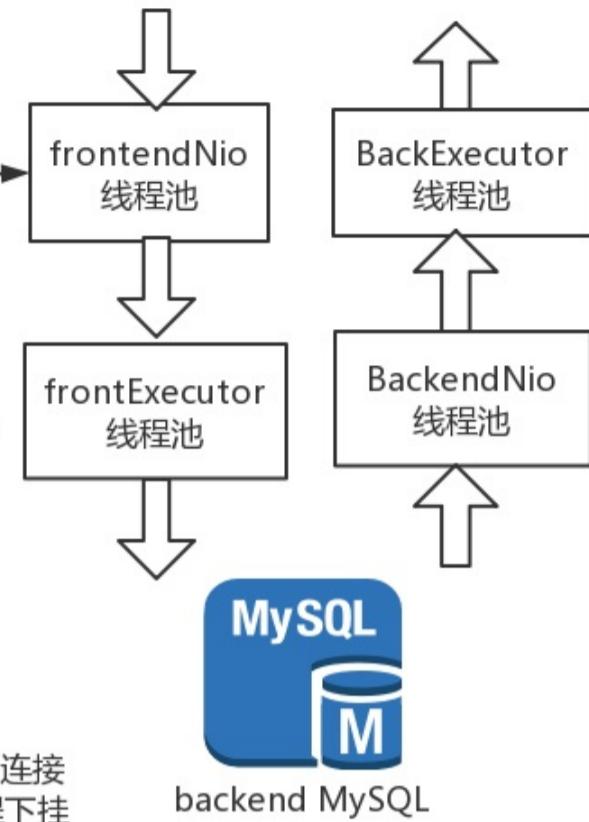


Nio处理器线程负责所有逻辑
包括数据接收(IO)
解析路由(内部计算)
请求下发(IO)等

Nio处理器线程只负责数据接收...
executor线程负责内部计算

NIO线程池中有多个Nio连接器线程，每个连接器线程下挂载了数量不一的tcp连接

dble 2.18.02以及之后版本



Nio处理器 (处理线程) 内部为挂载不定数量个连接，并且循环响应每个连接的请求

在数据处理和数据接收进行线程分割之后 (dble 2.18.02) , 使得dble可以并发响应挂载在同一个NIO连接器 (同一个processor线程) 上的请求

e.g.

恰好我们存在场景连接1 , 2同时有请求过来 , 旧版本需要循环处理连接1 , 2的任务 , 在连接1的任务处理完成之前 , 连接2的任务无法进行处理

新的IO结构中 , 连接1的数据被接收完毕之后 , NIO线程就可以接收连接2的数据 , 并且此时连接1的数据已经在executor线程池进行处理中 , 连接1 , 2之间的任务执行变成并行

0.3

0.3.0.1

- dbledbldble

0.3.0.2

dble

- MySQL


```
dblemysqlmysql
MySQL
A:$url=ip1:3306,$user=test,$password=testPsw
B:$url=ip2:3306,$user=test,$password=testPsw
/etc/hostsMySQL "NO ROUTE TO HOST"
```

- JVM


```
dblejavadblejava1.8JAVA_HOME
```

0.3.0.3

- (<https://github.com/actiontech/dble/releases>)
- dble

```
mkdir -p $working_dir
cd $working_dir
tar -xvf actiontech-dble-$version.tar.gz
cd $working_dir/dble/conf
mv cluster_template.cnf cluster.cnf
mv bootstrap_template.cnf bootstrap.cnf
mv db_template.xml db.xml
mv user_template.xml user.xml
mv sharding_template.xml sharding.xml
```

0.3.0.4 dble

- db.xml instanceM1 instanceM2 MySQL

```
<dbInstance name="instanceM1" url="ip1:3306" user="your_user" password="your_psw" maxCon="1000" minCon="10"
           primary="true">

<dbInstance name="instanceM2" url="ip2:3306" user="your_user" password="your_psw" maxCon="1000" minCon="10"
           primary="true"/>
```

0.3.0.5

-

```
cd $working_dir/dble
bin/dble start
```

- tail -f logs/wrapper.log
- mysqlble654321 mysql -p -P9066 -h 127.0.0.1 -u man1
- mysqlschema

```
create database @@shardingnode='dn$1-6';
```

- mysqlble123456 mysql -p -P8066 -h 127.0.0.1 -u root
- mysql

```
use testdb;
drop table if exists tb_enum_sharding;
create table if not exists tb_enum_sharding (
  id int not null,
  code int not null,
  content varchar(250) not null,
```

```
primary key(id)
)engine=innodb charset=utf8;
insert into tb_enum_sharding values(1,10000,'1'),(2,10010,'2'),(3,10000,'3'),(4,10010,'4');
```

0.3.1 (docker)

0.3.1.1

- dockerhubdbledble

0.3.1.2

- docker
- docker-composedocker-compose
- mysql

0.3.1.3

docker

```
docker network create -o "com.docker.network.bridge.name"="dbe-net" --subnet 172.18.0.0/16 dbe-net
docker run --name backend-mysql1 --ip 172.18.0.2 -e MYSQL_ROOT_PASSWORD=123456 -p 33061:3306 --network=dbe-net -d mysql:5.7 --server-id=1
docker run --name backend-mysql2 --ip 172.18.0.3 -e MYSQL_ROOT_PASSWORD=123456 -p 33062:3306 --network=dbe-net -d mysql:5.7 --server-id=2
sleep 30
docker run -d -i -t --name dble-server --ip 172.18.0.5 -p 8066:8066 -p 9066:9066 --network=dbe-net actiontech/dble:latest
docker 33061 33062 mysql 8066 9066
mysqldble
```

0.3.1.4

```
mysql80669066docker
8066 (SQL) root/123456
9066 () man1/654321
```

dble-server /opt/dble/conf/sharding.xml

mysql

```
# dble
mysql -P8066 -u root -p123456 -h 127.0.0.1
# dble
mysql -P9066 -u man1 -p654321 -h 127.0.0.1
#mysql1
mysql -P33061 -u root -p123456 -h 127.0.0.1
#mysql2
mysql -P33062 -u root -p123456 -h 127.0.0.1
```

0.3.1.5

```
docker stop backend-mysql1
docker stop backend-mysql2
docker stop dble-server
docker rm backend-mysql1
docker rm backend-mysql2
docker rm dble-server
docker network rm dbe-net
```

0.3.1.6 docker-compose

docker-composegithub

```
wget https://raw.githubusercontent.com/actiontech/dble/master/docker-images/quick-start/docker-compose.yml
```

docker-composemysqldble

```
docker-compose up
```

```
dble quick-start dble dble-server 8066/9066 root/123456 8066mysql 33061/33062root/123456
```

```
docker-compose stop  
docker-compose rm
```

0.3.1.7 docker-compose

dbledble dble

dblevolumesdockerdble/confdble

docker-compose.yml dble-server

```
volumes:  
- /opt/test/conf:/opt/self_conf
```

/opt/test/conf/opt/self_conf dble-server

```
command: ["/opt/dble/bin/wait.sh", "backend-mysql1:3306", "--", "/opt/self_conf/docker_init_start.sh"]
```

/opt/dble/bin/docker_init_start.sh self_conf

- /opt/dble/conf
- /opt/dble/bin/dble startdble
- /opt/dble/bin/wait-for-it.sh dble 8066 dble
- mysqldble

0.3.2 dble build

0.3.2.1

- dble docker
- docker-compose dble

0.3.2.2

- docker
- docker-compose

0.3.2.3

dockerhub

1. <http://blog.luckly-mjw.cn/tool-show/github-directory-downloader/index.html> dble <https://github.com/actiontech/dble/tree/master/docker-images>
2. dble_master_docker-images.zip

```
mkdir -p $working_dir
cd $working_dir
unzip dble_master_docker-images.zip
cd docker-images/dble-image
```

3. dble -t dble tag

```
docker build --build-arg MODE=quick-start --build-arg DBLE_VERSION=latest -t="actiontech/dble:latest" .
```

MODE docker mgrrwSplitquick-start

DBLE_VERSION docker dble

1. MODE \$working_dir/docker-images/dble-image
2. 3.20.10.0 3.20.10.0 3.20.10.0

0.3.2.4 docker-compose

dble \$working_dir/docker-images mgrquick-startrwSplit docker-compose

- mgrmgr(mysql) dble
- quick-start mysql dble
- rwSplit mysql dble

```
docker-compose up -d
```

```
docker-compose stop
docker-compose rm
```

0.3.2.5

0.3.2.5.1

- 1.

```
mysql> show slave status\G;
***** 1. row *****
Slave_IO_State: Waiting for master to send event
      Master_Host: 10.186.61.151
      Master_User: user
      Master_Port: 33306
     Connect_Retry: 60
    Master_Log_File: mysql-bin.000004
   Read_Master_Log_Pos: 154
      Relay_Log_File: 4bad16278f02-relay-bin.000006
       Relay_Log_Pos: 367
      Relay_Master_Log_File: mysql-bin.000004
```

```

Slave_IO_Running: Yes
Slave_SQL_Running: Yes
Replicate_Do_DB:
Replicate_Ignore_DB:
Replicate_Do_Table:
Replicate_Ignore_Table:
Replicate_Wild_Do_Table:
Replicate_Wild_Ignore_Table:
    Last_Error:
    Skip_Counter: 0
    Last_Log_Pos: 0
    Exec_Master_Log_Pos: 154
    Relay_Log_Space: 747
    Until_Condition: None
    Until_Log_File:
    Until_Log_Pos: 0
Master_SSL_Allowed: No
Master_SSL_CA_File:
Master_SSL_CA_Path:
    Master_SSL_Cert:
    Master_SSL_Cipher:
    Master_SSL_Key:
Seconds_Behind_Master: 0
Master_SSL_Verify_Server_Cert: No
    Last_IO_Errno: 0
    Last_IO_Error:
    Last_SQL_Errno: 0
    Last_SQL_Error:
Replicate_Ignore_Server_Ids:
    Master_Server_Id: 1
        Master_UUID: 46bb9692-e5f3-11ea-8340-0242ac110002
    Master_Info_File: /var/lib/mysql/master.info
        SQL_Delay: 0
    SQL_Remaining_Delay: NULL
Slave_SQL_Running_State: Slave has read all relay log; waiting for more updates
Master_Retry_Count: 86400
    Master_Bind:
Last_IO_Error_Timestamp:
Last_SQL_Error_Timestamp:
    Master_SSL_Crl:
    Master_SSL_Crlpath:
    Retrieved_Gtid_Set:
    Executed_Gtid_Set:
        Auto_Position: 0
Replicate_Rewrite_DB:
    Channel_Name:
    Master_TLS_Version:
1 row in set (0.00 sec)

```

0.3.2.5.2 mgr

1. mgr

```

[root@localhost]docker-images# docker exec mgr-a-1 mysql -h127.0.0.1 -p3306 -uroot -p123456 \
-e "SHOW STATUS LIKE 'group_replication_primary_member';" \
-e "SELECT * FROM performance_schema.replication_group_members;" \
+-----+-----+
| Variable_name | Value |
+-----+-----+
| group_replication_primary_member | 72da84d7-0c4b-11eb-9f0e-0242ac120002 |
+-----+-----+
+-----+-----+-----+-----+-----+
| CHANNEL_NAME | MEMBER_ID | MEMBER_HOST | MEMBER_PORT | MEMBER_STATE |
+-----+-----+-----+-----+-----+
| group_replication_applier | 72da84d7-0c4b-11eb-9f0e-0242ac120002 | mgr-a-1 | 3306 | ONLINE |
| group_replication_applier | 7314efdd-0c4b-11eb-ba28-0242ac120004 | mgr-a-3 | 3306 | ONLINE |
| group_replication_applier | 733b00fe-0c4b-11eb-bbea-0242ac120003 | mgr-a-2 | 3306 | ONLINE |
+-----+-----+-----+-----+-----+
[root@localhost]docker-images# docker exec mgr-b-1 mysql -h127.0.0.1 -p3306 -uroot -p123456 \
-e "SHOW STATUS LIKE 'group_replication_primary_member';" \
-e "SELECT * FROM performance_schema.replication_group_members;" \
+-----+-----+
| Variable_name | Value |
+-----+-----+
| group_replication_primary_member | 728c327d-0c4b-11eb-9300-0242ac120005 |

```

CHANNEL_NAME	MEMBER_ID	MEMBER_HOST	MEMBER_PORT	MEMBER_STATE
group_replication_applier	728c327d-0c4b-11eb-9300-0242ac120005	mgr-b-1	3306	ONLINE
group_replication_applier	732c5b3b-0c4b-11eb-9eb1-0242ac120007	mgr-b-3	3306	ONLINE
group_replication_applier	733c6350-0c4b-11eb-b0fb-0242ac120006	mgr-b-2	3306	ONLINE

2. dble, dble-server/opt/dble/logs/

```
[root@localhost]docker-images# docker exec -it dble-server bash
[root@dbe-server /]# less /opt/dble/logs/wrapper.log
[root@dbe-server /]# less /opt/dble/logs/dble.log

#bootstrap.cnfuseOuterHafalse
[root@dbe-server /]# less /opt/dble/logs/custom_mysql_ha.log
```

3. dble-server/opt/dble/conf/db.xml

```
[root@localhost]# docker exec -it dble-server bash
[root@dbe-server /]# cat /opt/dble/conf/db.xml

<dbGroup name="dbGroup1" rwSplitMode="2" delayThreshold="10000">
    <heartbeat>show slave status</heartbeat>
    <dbInstance name="instanceM1" url="172.18.0.2:3306" user="root" password="123456" maxCon="300" minCon="10"
        primary="true" readWeight="1" id="xx1">
    </dbInstance>
    <dbInstance name="instanceS1" url="172.18.0.3:3306" user="root" password="123456" maxCon="1000" minCon="10" readWeight="2">
        <property name="testOnCreate">false</property>
    </dbInstance>
    <dbInstance name="instanceS2" url="172.18.0.4:3306" user="root" password="123456" maxCon="1000" minCon="10" readWeight="2">
        <property name="testOnCreate">false</property>
    </dbInstance>
</dbGroup>
```

4. mgr-a-1dbe-servercustom_mysql_ha.log 172.18.0.2:3066...is not alive db.xml dbGroup1 instanceS1

```
[root@localhost]docker-images# docker-compose stop mgr-a-1
[root@localhost]docker-images# docker exec -it dble-server bash
[root@dbe-server /]# less /opt/dble/logs/custom_mysql_ha.log
...
2020-10-12 07:05:08 [DBLEDbGroupsCheck] [INFO] DbInstance 172.18.0.2:3306 in dbGroup1 is not alive!
2020-10-12 07:05:08 [DBLEDbGroupsCheck] [INFO] DbInstance 172.18.0.3:3306 in dbGroup1 is normal!
2020-10-12 07:05:08 [DBLEDbGroupsCheck] [INFO] DbInstance 172.18.0.4:3306 in dbGroup1 is normal!
2020-10-12 07:05:08 [DBLEDbGroupsCheck] [INFO] DbInstance 172.18.0.5:3306 in dbGroup2 is normal!
2020-10-12 07:05:08 [DBLEDbGroupsCheck] [INFO] DbInstance 172.18.0.6:3306 in dbGroup2 is normal!
2020-10-12 07:05:08 [DBLEDbGroupsCheck] [INFO] DbInstance 172.18.0.7:3306 in dbGroup2 is normal!
...

[root@dbe-server /]# cat /opt/dble/conf/db.xml

<dbGroup name="dbGroup1" rwSplitMode="2" delayThreshold="10000">
    <heartbeat>show slave status</heartbeat>
    <dbInstance name="instanceM1" url="172.18.0.2:3306" user="root" password="123456" maxCon="300" minCon="10"
        readWeight="1" id="xx1">
    </dbInstance>
    <dbInstance name="instanceS1" url="172.18.0.3:3306" user="root" password="123456" maxCon="1000" minCon="10" readWeight="2" primary=
"true">
        <property name="testOnCreate">false</property>
    </dbInstance>
    <dbInstance name="instanceS2" url="172.18.0.4:3306" user="root" password="123456" maxCon="1000" minCon="10" readWeight="2">
        <property name="testOnCreate">false</property>
    </dbInstance>
</dbGroup>
```

0.4**0.4.1**

- dble
 - mysql
 - mysql
 - mysql

0.4.2

- ,
- joinjoin
- :
 - 23
 - QPSTPS
- QPSTPSSQL

0.4.3

-
-

1.dble

- - [cluster.cnf](#):
 - [bootstrap.cnf](#):JVMdble
 - [user.xml](#):dble
 - [db.xml](#)
 - [sharding.xml](#)
 - [log4j.xml](#)[log4j2.xml](#)
 -
 - [cache](#)
 -
 -
 -
 - [Schema](#)
- - [/logs/wrapper.logdble](#)
 - [/logs/dble.logdbledble](#)
- -

dble 3.20.07.0 [2.20.04.0](#)

2.

dble_update_config2.20.04.0 3.20.07.02.20.04.0

- AMD——[dble_update_config](#)
- ARM——[dble_update_config_arm64](#)

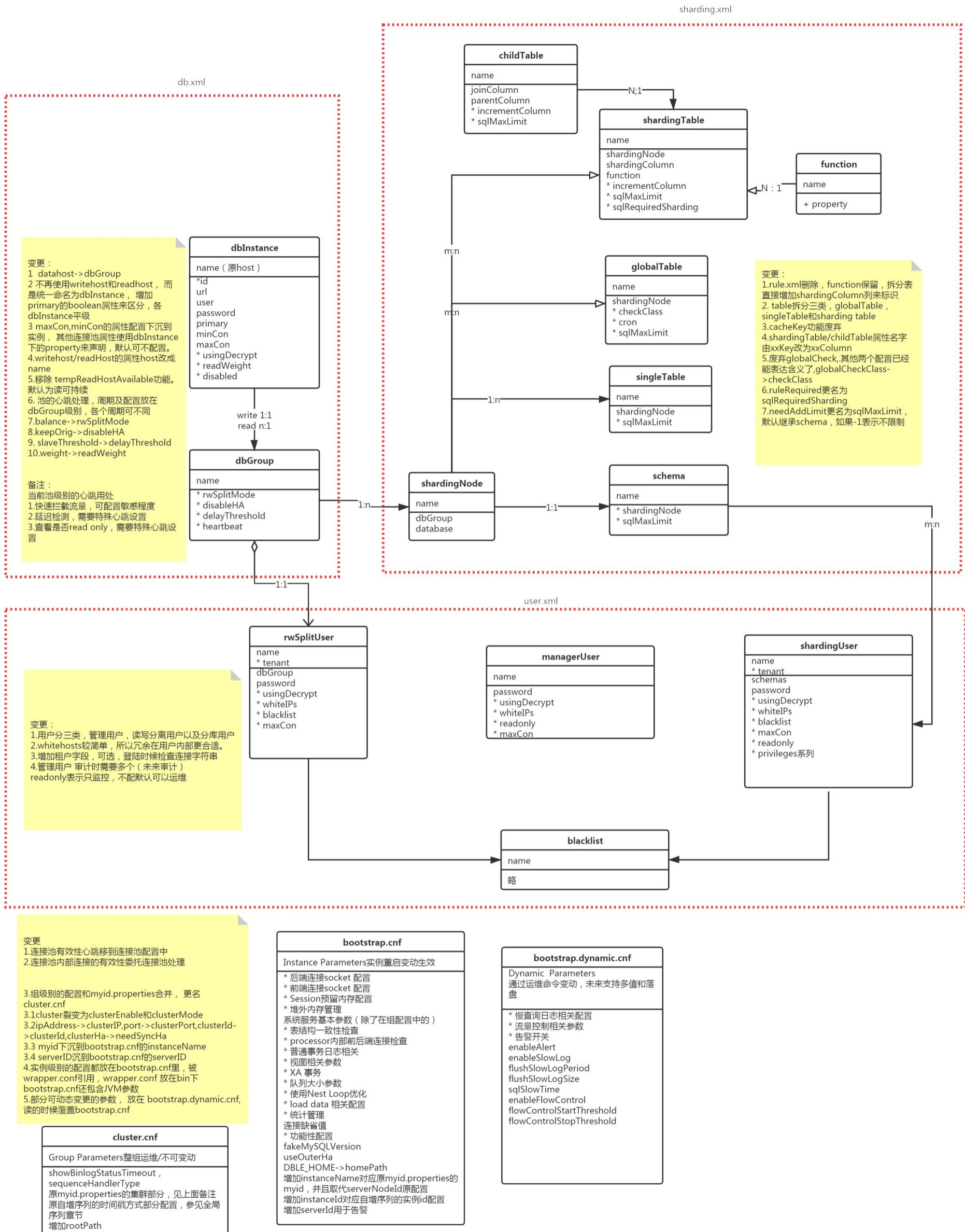
```
dble_update_config/dble_update_config_arm64 [-i=read_dir] [-o=write_dir] [-p=rootPath]
```

read_dir/write_dir: rootPath:zk,	/dble , ucore ,	universe/dble
----------------------------------	---	-------------------------------

:
 myid.properties
 wrapper.conf
 server.xml
 schema.xml
 rule.xml
 log4j2.xml
 cacheservice.properties(option)
 sequence_distributed_conf.properties for type3 (option)
 sequence_time_conf.properties for type2 (option)

:
 cluster.cnf
 bootstrap.cnf
 user.xml
 db.xml
 sharding.xml
 log4j2.xml
 cacheservice.properties(option)

3.



1.1 cluster.cnf

```
key=valuedbleblekey/value
dbleDDL
,dble(zk),dble
sequenceHandlerType
```

	&	/	
clusterEnable		true/falsefalse	clusterIPclusterPortrootPath clusterID
clusterMode		zk/ucoreclusterEnable	zkzookeeperucore
clusterIP	IP	clusterEnable	clusterModezk 10.186.19.aa:2281,10.186.60.bb:2281 clusterModecoreucoreipIP
clusterPort			clusterModezkclusterModeucore ucore
rootPath		clusterEnable	
clusterId	dble	clusterEnable	dbledble
needSyncHa	ha	true/falsefalse	trueuseOuterHattrue
showBinlogStatusTimeout	binlog	60000 ,	binlog
sequenceHandlerType		1~42	1MySQL offset-step sequence 2(Snowflake) 3time(Snowflake) 4offset-step
sequenceStartTime		2010-11-04 09:42:54	sequenceHandlerType23
sequenceInstanceByZk	timezkid	true/false,true	sequenceHandlerType3clusterModezk
grpcTimeout	ucoregrpc	10s	clusterModeucore

1.1.1

```
clusterEnable=false
#showBinlogStatusTimeout=60000
sequenceHandlerType=2
#sequenceStartTime=2010-11-04 09:42:54
#sequenceInstanceByZk=true
```

1.1.2 ZK

```
clusterEnable=true
clusterMode=zk
clusterIP=10.186.19.aa:2281,10.186.60.bb:2281
rootPath=/dble
clusterId=cluster-1
#needSyncHa=false
#showBinlogStatusTimeout=60000
sequenceHandlerType=2
#sequenceStartTime=2010-11-04 09:42:54
#sequenceInstanceByZk=true
```

1.1.3 ucore

```
clusterEnable=true
clusterMode=ucore
clusterIP=10.186.19.aa,10.186.60.bb
clusterPort=5700
```

```
rootPath=universe/dble
clusterId=cluster-1
#needSyncHa=false
#showBinlogStatusTimeout=60000
sequenceHandlerType=2
#sequenceStartTime=2010-11-04 09:42:54
#sequenceInstanceByZk=true
#grpcTimeout=10
```

1.2 bootstrap.cnf

dblewrapper.cnfwrapper

1.2.1 jvm

JVM,

```
-agentlib:jdwp=transport=dt_socket,server=y,address=8088,suspend=
-server
-XX:+AggressiveOpts
-Dfile.encoding=UTF-8
-Dcom.sun.management.jmxremote
-Dcom.sun.management.jmxremote.port=1984
-Dcom.sun.management.jmxremote.authenticate=false
-Dcom.sun.management.jmxremote.ssl=false
-Dcom.sun.management.jmxremote.host=127.0.0.1
-Xmx4G
-Xms1G
-XX:MaxDirectMemorySize=2G
```

JVMJVM

MaxDirectMemorySize81917M79G bufferPoolPageNumber*bufferPoolPageSize

bufferPoolPageNumber = (MaxDirectMemorySize * 0.8 /bufferPoolPageSize), 32767

bufferPoolPageSize = 2M

dble=0.6 (,)

Xmx = 0.4 dble

MaxDirectMemorySize = 0.6 * dble

bufferPoolPageNumber bufferPoolPageSize MaxDirectMemorySize

1.2.2 dble

dble,-Dkey=value

JSWdbleJSW

wrapper.app.parameter_file

sql

		/			
	homePath	slowlogs viewConf xatm xalog load datatemp	,		,
	instanceName			xa	
	instanceId	id			sequenceHandlerType=2 3.
					sequenceHandlerType=2 0~1023
					sequenceHandlerType=3 0~,511
	serverId		IP	dble	
	bindIp	IP	"0.0.0.0"	IP	IP,

serverPort		8066		
managerPort		9066		
maxCon		0	maxCon0,maxCon,, maxcon manager	maxCon
NIOFrontRW	NIOprocessors NIOFrontRW processors NIOFrontRW	java ,	IO	
NIOBackendRW	NIO backendProcessors NIOBackendRW backendProcessors NIOBackendRW	java ,	IO	
frontWorker	processorExecutor frontWorker processorExecutor frontWorker	(2,)		
managerFrontWorker		(2,/2)	&	
backendWorker	backendProcessorExecu torbackendWorker backendProcessorExecu torbackendWorker	(2,)		
complexQueryWorker	complexExecutor complexQueryWorker complexExecutor complexQueryWorker	(2,88		
writeToBackendWorker	SQL writeToBackendExecuto r writeToBackendWorker writeToBackendExecuto r writeToBackendWorker	(2,)	SQL	
fakeMySQLVersion	DbleMysql	NULL	MySQL, + Mysql, + MySQLMySQL 5.7.20<=<8.0.0 ="" ="">=8.0.3 1.fakeMySQLVersion 5.7.20 mysql-version 5.7.25 2.fakeMySQLVersion 8.0.3 mysql-version 8.0.23 3.fakeMySQLVersion 5.7.15 mysql-version 8.0.1 Mysql	MYSQL

	usePerformanceMode		0/	DbleCPU,	1-0-
	useOuterHa		true	dble	true/false
groupConcatMaxLen	GROUP CONCAT()	1024	GROUP CONCAT()		
	charset		utf8mb4		
	maxPacketSize		4×1024×1024	dble(+1024) dbInstancedbInstance -1024.1024SQL	
	txIsolation		3	SQL dbledbInstancesession sessionSQLsession set	1- READ_UNCOMMITTED 2-READ_COMMITTED 3-REPEATABLE_READ 4-SERIALIZABLE
	autocommit		1	dbledbInstance sessionSQLsession set	0/1
	useCompression		0	mysql	1 - 0 -
	capClientFoundRows	Client_Found_Rows	false	dbleClient_Found_Rows	true - false -
	usingAIO	AIO	0	AIONIO	1 - 0 -
	useThreadUsageStat		0/	show @@thread_used	1-0-
	useCostTimeStat		0/	BTraceCostTime.java ,show @@cost_time	1-0-
	maxCostStatSize		100	show @@cost_time	
	costSamplePercent		1/%	costSamplePercent	
	checkTableConsistency		0	1 DB	1-,0-
	checkTableConsistency Period		30×60×1000 ,		
	sqlExecuteTimeout		300 ,		

processor	idleTimeout		$10 \times 60 \times 1000$,	processor	
	processorCheckPeriod	processor	1000 ,	processor	
socket	backSocketSoRcvbuf		$1024 \times 1024 \times 4$,	buffer	
	backSocketSoSndbuf		1024×1024 ,	buffer	
	backSocketNoDelay	Nagle	1/		1-, 0-
socket	frontSocketSoRcvbuf		1024×1024 ,		
	frontSocketSoSndbuf		$1024 \times 1024 \times 4$,	buffer	
	frontSocketNoDelay	Nagle	1		1-,0-
Session	orderMemSize	sessionorder	4,M	sessionorder by	
	otherMemSize	session	4,M	sessionsubQuery distinctd	
	joinMemSize	sessionjoin	4M	sessionjoin	
	bufferPoolChunkSize		4096,		
	bufferPoolPageNumber		$0.8 \times$ MaxDirectMemorySize / bufferPoolPageSize(defa ult 2M)	bufferPoolPageSize	
	bufferPoolPageSize		$1024 * 1024 * 2$,	bufferPoolPageNumbe r * bufferPoolPageSize OOM	
	mappedFileSize		$1024 \times 1024 \times 64$,	,	
maxResultSet		512×1024 ,	SQL		

	maxResultSet		512×1024 ,	SQL	
	enableSessionActiveRatioStat		1	(-DusePerformanceMode=1)	01
	enableConnectionAssociateThread	/	1	/(-DusePerformanceMode=1)	01
	recordTxn	log	0	log	1-0-
	transactionLogBaseDir	log	/txlogs	log	
	transactionLogBaseName	log	server-tx		
	transactionRotateSize		16,M		
	xaRecoveryLogBaseDir	xatm	dble/xalogs/	XADblexa	
	xaRecoveryLogBaseName	xatm	xalog		
XA	xaSessionCheckPeriod	XA	1000 ms	server	
	xaLogCleanPeriod	XAlog	1000 ms	session	
	xaRetryCount	XA	0	server	
	xaIdCheckPeriod	XA	300s	XA log	
				XA0	
				Xid 0	
	viewPersistenceConfBaseDir		dble/viewConf	,	
	viewPersistenceConfBaseName		viewJson	,	
	joinQueueSize	join,	1024		
	mergeQueueSize	merge,	1024		
	orderByQueueSize	,	1024		
	useJoinStrategy	nest loop		joinwhereSQL	true false
				-1 useJoinStrategy=true useJoinStrategy	

join	joinStrategyType	nest loop	-1nestloop	nestloop0 nestloop(useJoinStrategy)1 useJoinStrategy(useJoinStrategy),2 alwaysTryNestLoop(useJoinStrategy)	-12
	nestLoopConnSize		4		
	nestLoopRowsSize		2000		
	inSubQueryTransformTOJoin	injoin	false	indbljeoinsql	true false
	enableSlowLog		0		01
	slowLogBaseDir		dble/slowlogs		
	slowLogBaseName		slow-query	(.log)	
	flushSlowLogPeriod		1		
	flushSlowLogSize		1000	1	
	sqlSlowTime		100		0
	slowQueueOverflowPolicy		2	2000 1SQL 2SQL3s	12
	maxCharsPerColumn		65535		
	maxRowSizeToFile	load data	100000	load data OOMload data,	
	enableBatchLoadData	load data	0	load data maxRowSizeToFile	01
	enableFlowControl	true/false	false		true/false
	flowControlHighLevel		41943044096K		
	flowControlLowLevel		262144256K		
	enableCursor	server-side-cursor.	false	prepare statement 4.4	true or false
	maxHeapTableSize	,byte	4096		0
	heapTableBufferChunkSize	buffer cache	bufferPoolChunkSize, byte	buffer	bufferPoolChunkSize

	enableGeneralLog	genegral	0	sqlgeneral	0/1
	generalLogFile	general	general/general.log	'/homepath	
general	generalLogFileSize	general	16M	general.logyyyy-MM/general-MM-dd-%d.loglog4j	
	generalLogQueueSize	general	4096	log4jAsyncLogger	2
	enableStatistic		0		1, 0
	enableStatisticAnalysis	sqlusertablecondition	0	show @@sql.sum.user show @@sql.sum.tableshow @@sql.condition	1, 0
	associateTablesByEntryByUserTableSize	sql_statistic_by_associate_tables_by_entry_by_user	1024		1
sql statistic	frontendByBackendByEntryByUserTableSize	sql_statistic_by_frontend_by_backend_by_entry_by_user	1024		1
	tableByUserByEntryTableSize	sql_statistic_by_table_by_user_by_entry	1024		1
	statisticQueueSize	sql statistic	4096	log4jAsyncLogger	2
	samplingRate	sql	100	samplingRate100dble 41004	[0,100]
	sqlLogTableSize	sql log	1024	(sql)	
	rwStickyTime	0()	1000(ms), 0()	SQLSQL rwStickyTimeSQL()	.
	district	dble,	null	db.xmlldbInstance dbDistrict	
	dataCenter	dble,	null	db.xmlldbInstance dbDataCenter	
	enableMemoryBufferMonitor		0		01
	enableMemoryBufferMonitorRecordPool		1		01

	enableSqlDumpLog		0	(sql	
	sqlDumpLogBasePath	base	sqldump	base	0/1
	sqlDumpLogFileName		sqldump.log	sqldump/sqldump.log	
	sqlDumpLogCompressFilePattern		\${date:yyyy-MM}/sqldump-%d{MM-dd}-%i.log.gz	sqldump/2022-10/sqldump-10-11-1.log.gz)	
	sqlDumpLogOnStartup Rotate		1	1-0-	1-0-
	sqlDumpLogSizeBasedRotate		50MB	sqldump.log50MB :KBMBGB	
	sqlDumpLogTimeBasedRotate		1	1	
	sqlDumpLogDeleteFileAge		90d	90:d()h()m() s() sqlDumpLogCompressFilePatternlog4j2	
	sqlDumpLogCompressFilePath		*/sqldump-*.log.gz	sqlDumpLogCompressFilePath sqlDumpLogDeleteFileAge	
tcp	tcpKeepIdle	tcp-keepalive	30s,	dbleKeepalivejdk 2.38	
	tcpKeepInterval	tcp-keepalive	10s	dbletcp-keepalivejdk 2.38	
	tcpKeepCount	tcp-keepalive	3	tcp-keepalivejdk 2.38	

1.2.3 bootstrap.dynamic.cnf

bootstrap.dynamic.cnf dblebootstrap.cnf

```

enableAlert
enableSlowLog
flushSlowLogPeriod
flushSlowLogSize
sqlSlowTime
enableFlowControl
flowControlLowLevel
flowControlHighLevel
enableGeneralLog
generalLogFile
enableStatistic
associateTablesByEntryByUserTableSize
frontendByBackendByEntryByUserTableSize
tableByUserByEntryTableSize
enableBatchLoadData

```

```
enableBatchLoadData
maxRowSizeToFile
enableMemoryBufferMonitor
xaIdCheckPeriod
enableSqlDumpLog
```

1.2.4

```
#encoding=UTF-8
-agentlib:jdwp=transport=dt_socket,server=y,address=8088,suspend=
-server
-XX:+AggressiveOpts
-Dfile.encoding=UTF-8
-Dcom.sun.management.jmxremote
-Dcom.sun.management.jmxremote.port=1984
-Dcom.sun.management.jmxremote.authenticate=false
-Dcom.sun.management.jmxremote.ssl=false
-Dcom.sun.management.jmxremote.host=127.0.0.1
-Xmx4G
-Xms1G
-XX:MaxDirectMemorySize=2G
# base config
-DhomePath=.
-DinstanceName=1
# valid for sequenceHandlerType=2 or 3
-DinstanceId=1
-DserverId=xxx1
#-DbindingIp=0.0.0.0
#-DserverPort=8066
#-DmanagerPort=9066
#-DmaxCon=1024
#-DNIOFrontRW=4
#-DNIOBackendRW=12
#-DfrontWorker=4
#-DmanagerFrontWorker=2
#-DbackendWorker=12
#-DcomplexQueryWorker=8
#-DwriteToBackendWorker=4

-DfakeMySQLVersion=5.7.11

# serverBacklog size, default 2048
-DserverBacklog=2048

#-DusePerformanceMode=0
# if need out HA
-DuseOuterHa=true

# connection
#-Dcharset=utf8mb4
-DmaxPacketSize=167772160
-DtxIsolation=2
#-Dautocommit=1

#parameter for mysql
#-DgroupConcatMaxLen=1024

# option
#-DuseCompression=1
-DusingAIO=0

-DuseThreadUsageStat=1
# query time cost statistics
#-DuseCostTimeStat=0
#-DmaxCostStatSize=100
#-DcostSamplePercent=1

# consistency
# check the consistency of table structure between nodes, default not
-DcheckTableConsistency=0
# check period, the default period is 60000 milliseconds
-DcheckTableConsistencyPeriod=60000

# processor check conn
```

```

-DprocessorCheckPeriod=1000
-DsqlExecuteTimeout=3000
-DidleTimeout=1800000

#-DbackSocket unit:bytes
#-DbackSocketSoRcvbuf=4194304
#-DbackSocketSoSndbuf=1048576
#-DbackSocketNoDelay=1

# frontSocket
#-DfrontSocketSoRcvbuf=1048576
#-DfrontSocketSoSndbuf=4194304
#-DfrontSocketNoDelay=1

# query memory used for per session,unit is M
-DotherMemSize=4
-DorderMemSize=4
-DjoinMemSize=4

# off Heap unit:bytes
-DbufferPoolChunkSize=32767
-DbufferPoolPageNumber=512
-DbufferPoolPageSize=2097152
#-DmappedFileSize=2097152

# transaction log
# 1 enable record the transaction log, 0 disable ,the unit of transactionRotateSize is M
-DrecordTxn=0
#-DtransactionLogBaseDir=/txlogs
#-DtransactionLogBaseName=server-tx
#-DtransactionRotateSize=16
# XA transaction
# use XA transaction ,if the mysql service crash,the unfinished XA commit/rollback will retry for several times , it is the check period
for ,default is 1000 milliseconds
-DxaSessionCheckPeriod=1000
# use XA transaction ,the finished XA log will removed. the default period is 1000 milliseconds
-DxaLogCleanPeriod=1000
# XA Recovery Log path
# -DxaRecoveryLogBaseDir=/xalogs/
# XA Recovery Log name
#-DxaRecoveryLogBaseName=xalog
# XA Retry count, retry times in backend, 0 means always retry until success
#-DxaRetryCount=0

#-DviewPersistenceConfBaseDir=/viewPath
#-viewPersistenceConfBaseName=viewJson

# for join tmp results
#-DmergeQueueSize=1024
#-DorderByQueueSize=1024
#-DjoinQueueSize=1024

# true is use JoinStrategy, default false
#-DuseJoinStrategy=true
#-DjoinStrategyType=-1
-DnestLoopConnSize=4
-DnestLoopRowsSize=2000

# if enable the slow query log
-DenableSlowLog=1
# the slow query log location
#-DslowLogBaseDir=./slowlogs
#-DslowLogBaseName=slow-query
# the max period for flushing the slow query log from memory to disk after last time , unit is second
-DflushSlowLogPeriod=1
# the max records for flushing the slow query log from memory to disk after last time
-DflushSlowLogSize=1000
# the threshold for judging if the query is slow , unit is millisecond
-DsqlSlowTime=100

# used for load data,maxCharsPerColumn means max chars length for per column when load data
#-DmaxCharsPerColumn=65535
# used for load data, because dble need save to disk if loading file contains large size

```

```

if enable the batch load data
#-DenableBatchLoadData=1
#enableFlowControl=false
#-DflowControlHighLevel=4194304
#-DflowControlLowLevel=262144

# if enable the general log
#-DenableGeneralLog=1
# general log file path
#-DgeneralLogFile=general/general.log
# maximum value of file, unit is mb
#-DgeneralLogFileSize=16
# the queue size must not be less than 1 and must be a power of 2
#-DgeneralLogQueueSize=4096

# if enable statistic sql
#-DenableStatistic=1
#-DenableStatisticAnalysis=0
#-DassociateTablesByEntryByUserTableSize=1024
#-DfrontendByBackendByEntryByUserTableSize=1024
#-DtableByUserByEntryTableSize=1024
# processing queue size must not be less than 1 and must be a power of 2
#-DstatisticQueueSize=4096
# samplingRate
#-DsamplingRate=100
# size of sql log table
#-DsqlLogTableSize=1024
#-DmaxResultSet=524288

#-DinSubQueryTransformToJoin=false
#For rwSplitUser, Implement stickiness for read and write instances, the default value is 1000ms
#-DrwStickyTime=1000

# if enable frontend connection activity ratio statistics
#-DenableSessionActiveRatioStat=1
# if enable frontend connection and backend connection are associated with threads
#-DenableConnectionAssociateThread=1
#-Ddistrict=
#-DdataCenter=
#-DxaIdCheckPeriod=300

# whether enable the memory buffer monitor
#-DenableMemoryBufferMonitor=0
#-DenableMemoryBufferMonitorRecordPool=1

#-DenableSqlDumpLog=0
#-DsqlDumpLogBasePath=sqldump
#-DsqlDumpLogFile=sqldump.log
#-DsqlDumpLogCompressFilePattern=${date:yyyy-MM}/sqldump-%d{MM-dd}-%i.log.gz
#-DsqlDumpLogOnStartupRotate=1
#-DsqlDumpLogSizeBasedRotate=50MB
#-DsqlDumpLogTimeBasedRotate=1
#-DsqlDumpLogDeleteFileAge=90d
#-DsqlDumpLogCompressFilePath=*.log.gz

#-DtcpKeepIdle=30
#-DtcpKeepInterval=10
#-DtcpKeepCount=3

```

1.3 user.xml

1.3.1 XML

- managerUser ()
- shardingUser ()
- rwSplitUser ()
- analysisUser ()
- hybridTAUser ()
- blacklist()

1. user.xmlshardingUserdblesharding.xml(db)sharding.xml

1.3.2 managerUser()

		/	
name		mysql	
password			
usingDecrypt		true/falsefalse	passworddecrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5lOrRU1QRXu LTYtATUG0fGW2k5kdXUhKL5zf02h E6nGjdnSWrufVkJPUZpbQ2qX9uQ== password fP/nl3XPXrSfWjpQzit5lOrRU1QRXu LTYtATUG0fGW2k5kdXUhKL5zf02h E6nGjdnSWrufVkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
whiteIPs	ip		whiteIPs
readOnly		true/falsefalse	showselect
maxCon			,0 maxCon

1.3.3 shardingUser()

		/	
name		mysql	
password			
usingDecrypt		true/falsefalse	passworddecrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5lOrRU1QRXu LTYtATUG0fGW2k5kdXUhKL5zf02h E6nGjdnSWrufVkJPUZpbQ2qX9uQ== password fP/nl3XPXrSfWjpQzit5lOrRU1QRXu LTYtATUG0fGW2k5kdXUhKL5zf02h E6nGjdnSWrufVkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
whiteIPs	ip		whiteIPs
readOnly		true/falsefalse	DMLshowselect
tenant			tenant
schemas	schema		schemaschemasharding.xmlschma

maxCon			,0 maxConmaxCon
blacklist	blacklist		blacklist
privileges	table		privileges

1.3.3.1 user.privileges.schema

user.privileges schemadml

		/	
name	schema		schema
dml	dml	0000	INSERT UPDATE SELECT DELETE 1- 0- 1111
table			tableschema

1.3.3.2 user.privileges.schema.table

		/	
name			key
dml	dml	0000	INSERT UPDATE SELECT DELETE 1- 0- 1111

1.3.4 rwSplitUser()

		/	
name		mysql	
password			
usingDecrypt		true/falsefalse	passwordencrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5lIOrRU1QRXu LTYtATUG0fGW2k5kdXUhKL5zf02h E6nGjdnSWrufVlkJPUZpbQ2qX9uQ== password fP/nl3XPXrSfWjpQzit5lIOrRU1QRXu LTYtATUG0fGW2k5kdXUhKL5zf02h E6nGjdnSWrufVlkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
whiteIPs	ip		whiteIPs
tenant			tenant
dbGroup	dbGroup		db.xmldbGroup
maxCon			,0 maxConmaxCon
blacklist	blacklist		blacklist

1.3.5 analysisUser()

		/	
name		clickhouse	
password			
usingDecrypt		true/falsefalse	passworddecrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5IOrRU1QRXu uLTYtATUG0fGW2k5kdXUhKL5zf02h hE6nGjdnSWrufVkJPUZpbQ2qX9uQ== password fp/nl3XPXrSfWjpQzit5IOrRU1QRXu uLTYtATUG0fGW2k5kdXUhKL5zf02h hE6nGjdnSWrufVkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
whiteIPs	ip		whiteIPs
tenant			tenant
dbGroup	dbGroup		db.xmldbGroup dbGrouphybridTAUserapNode
maxCon			,0 maxConmaxCon
blacklist	blacklist		blacklist

1.3.6 hybridTAUser(HTAP)

- HTAP

		/	
name		mysql	
password			
usingDecrypt		true/falsefalse	passworddecrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5IOrRU1QRX uLTYtATUG0fGW2k5kdXUhKL5zf02h hE6nGjdnSWrufVkJPUZpbQ2qX9uQ== password fp/nl3XPXrSfWjpQzit5IOrRU1QRX uLTYtATUG0fGW2k5kdXUhKL5zf02h hE6nGjdnSWrufVkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
whiteIPs	ip		whiteIPs
readOnly		true/falsefalse	DMLshowselect
tenant			tenant
schemas	schema		schemaschemasharding.xmlschma dbGroupdatabaseTypeclickhouse
maxCon			,0 maxConmaxCon
blacklist	blacklist		blacklist
privileges	table		privileges

1.3.7 blacklist()

		/	
name	blacklist		
property			property

1.3.7.1 blacklist.property()

```
<property name="selectHavingAlwayTrueCheck">true</property>
```

keyvalue

- useAllow

multiStatementAllow		false	true false	sql >1 true false dble Dble			

- sql

					sql		
insertAllow	INSERT	true	true false	trueINSERT falseINSERT	insert into t1 valut1 values(4,5);		
deleteAllow	DELETE	true	true false	trueDELETE falseDELETE	delete from t1;		
updateAllow	UPDATE	true	true false	trueUPDATE falseUPDATE	update t1 set id = 1 where id =10;		
mergeAllow	merge	true	true false	truemerge falsemerge	insert into t1 valut1 values(4,5);	mysql,	mysql,
callAllow	call	true	true false	truecall falsecall	call proc_arc(1);	hint https://actiontech.github.io/dble-docs-cn/3.SQL_Syntax/3.6_procedure_support.html	
truncateAllow	Truncate	true	true false	trueTruncate falseTruncate	truncate table t1;		
createTableAllow		true	true false	truefalse	create table t1(id int, age int);		
renameTableAllow	Rename	true	true false	trueRename falseRename	rename table t1 to t4;		
alterTableAllow	Alter Table	true	true false	ALTER TABLE t1 RENAME t6 sqlrenam t1 to t6, RenameTableAllow trueAlter Tablefalse Alter Table	alter table t1 add d timestamp;		
dropTableAllow	DropTable	true	true false	trueDropTable false DropTable	drop table t1;		

setAllow	Set	true	true false	trueSet falseSet	set @name = 1;		
replaceAllow	Replace	true	true false	trueReplace falseReplace	replace into t1 values (1, 1);		
describeAllow	describe	true	true false	trueDescribe falseDescribe	describe t1 id;		
showAllow	show	true	true false	trueShow falseShow	show columns from t1;		
commitAllow	Commit	true	true false	trueCommit falseCommit	commit;		
rollbackAllow	Rollback	true	true false	trueRollback falseRollback	rollback;		
useAllow	Use	true	true false	trueUse falseUse	use db1;		
hintAllow	Hint	true	true false	trueHint falseHint	select * from t1/*!TEMPORA RY*/;		
lockTableAllow	LockTable	true	true false	trueLockTable falseLockTable	lock table t1 write;		
startTransactionAllow	StartTransaction	true	true false	trueStartTransaction falseStartTransaction	start transaction;		
blockAllow		true	true false	trueLockTable falseLockTable	begin select * from t1 where id=1end;		
noneBaseStatementAllow	DDL	false	true false	trueFalse			

- sql
expr

1.

					sql		
mustParameterized	where	false	true false	TrueWHERE ID = 1SQL 1.select * from t1 inner join t3 on t1.id = 1; where trueSQL false SQL	select * from t1 where t1.id = 1;		
constArithmeticallow		true	true false	truefalse	select * from t1 where 1>1; select * from t1 where id = 3-1; select * from t1 where true & false;		

limitZeroAllow	limit 0	false	true false	true limit 0 false limit 0	select * from t1 limit 0;		
selectAllow	SELECT	true	true false	true SELECT false SELECT tips:sqlDruid sql	select id from t1;		
selectAllColumnAllow		true	true false	1.expr SQLAllColumnExpr 2.exprsSqlSelect 3.sqlFrom 4.(x.*) 1.select t.* from t1 t; SQLAllColumnExpr 2.select * from t1t3; from 3.select * from t1 inner join t3; from truefalse	select * from t1;		
commentAllow		false	true false	truefalse	select * from t1 where id =1 or 1=1 /*dble:sql=select 1 from account */;		
conditionOpXorAllow	(wherehaving) XOR	false	true false	select * from t1 inner join t3 on t1.id =(1 xor 1); where having true(where having)XOR false(where having)XOR	select * from t1 where id = (1 xor 1); select * from t1 having id = (1 xor 1);		
conditionOpBitwiseAllow	"&" "~" "^" "^"	true	true false	true "&" "~" "^" "^" false "&" "~" "^" "^"	select * from t1 where id = (1 & 1); select * from t1 where id = (1 & select id from t1 limit1); select * from t1 where id = (1 ^ 1); select * from t1 where id = (1 ~ 1); select * from t1 where id = (1 1);		
conditionDoubleConstAllow		false	true false	and select *from t1 where 3=1 or 3=3; select *from t1 where 3=1 and (1=1 and 3=3); select *from t1 where 3=1 and (1=1 and 3=3); select * from t3 where 1=1 and k like '%'; conditionLikeTrueAllow false select * from t3 where 1=1 and 1= (select	select *from t1 where 3=1 and 3=3; select *from t1 where 3=1 or (1=1 and 3=3); select *from t1 where 3=1 and (1=1 and 3=3); select * from t3 where 1=1 and k like '%'; conditionLikeTrueAllow false select * from t3 where 1=1 and 1= (select		

					count(*) from t1 limit1); select * from t3 where 2=1 and true = true; select * from t3 where id =1 and true = true or id =1 or(1=1 and id =2);		
deletewh ereNoneC heck	DELETEwhere	false	true false	1.sqlwhere 2.using 3.from delete from t1 using t1 inner join t2; using delete t1,t2 from t1 left join t2 on t1.id=t2.id; from truewhere falsewhere	delete from t1; delete t1 from t1 left join t2 on t1.id=t2.id;		
updatewh ereNoneC heck	UPDATEwhere	false	true false	1.limit 1.update t1 set idd =1 limit 1; limit truewhere falsewhere	update t1 set idd =1 ;		
conditio nAndAlwa yFalseAl low	(WHERE/HAVIN G)AND	false	true false	true (WHERE/HAVIN G)ANDfalse (WHERE/HAVIN G)AND	select * from t1 where id = 567 and 2 = 1; select * from t1 having id =1 and 2=1;		
conditio nAndAlwa yTrueAll ow	(WHERE/HAVIN G)AND	false	true false	update t1 set id = 1 where 1=1 and (1 =1 or id =2) ; select * from t1 having id =1 and (1 =1 or id =2) ; true (WHERE/HAVIN G)ANDfalse (WHERE/HAVIN G)AND	select * from t1 where id = 567 and 1 = 1; update t1 set id = 1 where 1=1 and 1=1; select * from t3 where id = 567 and k like '%'; select * from t1 having id =1 and 1=1;		
conditio nLikeTru eAllow	(WHERE/HAVIN G)LIKE	true	true false	conditionLikeTru eAllowfalselike '%' conditionAndAlw ayTrueAllow true (WHERE/HAVIN G)LIKEfalse (WHERE/HAVIN G)LIKE	select * from t3 where id = 5 and k like '%'; select * from t1 having id =1 and k like '%';		
selectLi mit		-1	-1	selectselct		dble	dble

2.select into

					sql		
					select * into		

selectIn toAllow	SELECTINTO	true	true false	trueselect into falseselect into	@myvar from t1; select * from t1 into @myvar for update; select id, data into @x, @y from test.t1 limit 1;		
selectIn toOutfil eAllow	outfilesql SELECT ... INTO OUTFILE	false	true false	outfilesql true SELECT ... INTO OUTFILE falseSELECT ... INTO OUTFILE	select * from t1 where id in(select id into outfile '/exportdata/cust omers.txt' fields terminated by ',' optionally enclosed by "" lines terminated by '\n' from t1); sqlsqlrdruidsql		

3.AlwayTrue

					sql		
selectWh ereAlway TrueChec k	SELECTWHERE AlwayTrue	true	true false	AlwayTrue 1.where 2.sql 3.SQL update t1 set idd =1 where id = id 23 truesqlfalse sql	select id from t1 where id =1 union select 1 /*!dbe:sql=select 1 from account */;		
selectHa vingAlwa yTrueChe ck	SELECT HAVING AlwayTrue	true	true false	AlwayTrue selectWhereAlwa yTrueCheck truesqlfalse sql	select * from t1 having id = 1 or 1=1 /*!dbe:sql=select 1 from account */;		
deletewh ereAlway TrueChec k	DELETE WHERE AlwayTrue	true	true false	AlwayTrue selectWhereAlwa yTrueCheck truesqlfalse sql	delete from t1 where id = 1 or 1=1 /*!dbe:sql=select 1 from account */;		
updatewh ereAlayT rueCheck	UPDATE WHERE AlwayTrue	true	true false	AlwayTrue selectWhereAlwa yTrueCheck truesqlfalse sql	update t1 set idd =1 where id = id or 1=1 /*!dbe:sql=select 1 from account */		

4.

					sql		
caseCond itionCon stAllow		false	true false	1.caseselect 2. truefalse SQL	select id from t1 where id =1 union select 1 /*!dbe:sql=select 1 from account */;		
selectUn ionCheck	union check	true	true false	SELECT UNION 1.left sqlfrom 2.left sqlwhere 3.right sql from 4.UNION UNION ALL UNION DISTINCT 5.sql trueUNION falseUNION	select id from t1 where id =1 union select 1 /*!dbe:sql=select 1 from account */;		

--	--	--	--	--	--	--	--

5. functionCheck

tableCheck		true	true false	druidble	druiddble
functionCheck		true	true false	druidble	druiddble
objectCheck	""	true	true false	druidble	druiddble
variantCheck	""	true	true false	druidble	druiddble
readOnlyTables	SELECT INTO DELETEUPDATE INSERTMERGE""			SELECT INTO DELETEUPDATE INSERTMERGE	druiddble
schemaCheck	Schema	true	true false	druidble	druiddble

6.

selectMinusCheck	SELECT MINUS	true	true false	trueSELECT MINUS falseSELECT MINUS	mysql
selectExceptCheck	SELECT EXCEPT	true	true false	trueexceptfalse except	mysql
selectIntersectCheck	SELECT INTERSECT	true	true false	trueINTERSECT falseINTERSECT	mysql
strictSyntaxCheck		true	true false	Druid SQL ParserSQL SQL	druid
minusAllow	SELECT * FROM A MINUS SELECT * FROM B	true	true false	trueMINUSfalse MINUS	mysql
intersectAllow	SELECT * FROM A INTERSECT SELECT * FROM B	true	true false	trueintersectfalse intersect	mysql
completeInsertValuesCheck	dble1.0.311.2.6	false	true false	druid,	druiddble
doPrivilegedAllow	druid	false	true false	druidflag,	druiddble
wrapAllow	Connection/Statement/R esultSetisWrapFor unwrap	true	true false	druidflag	druiddble
metadataAllow	Connection.getMetadata	true	true false	druidflag	druiddble

1.3.8 tenant

dble

1. ::

```
mysql -u: -p -h
```

```
DriverManager.getConnection("jdbc:mysql://127.0.0.1:8066", "root2:tenant1", "123456");
```

2. JDBC-connectionAttributes connectionAttributes tenant

```
DriverManager.getConnection("jdbc:mysql://127.0.0.1:8066?connectionAttributes=tenant:tenant1", "root2", "123456");
```

1/21

1.3.9 whiteIPsIP

IP

ip192.168.1.2,192.168.2.22
 IP192.168.1.10-192.168.1.100
 192.168.1.%
 IP/CIDR192.168.1.1/20

IPV4/IPV6

- 127.0.0.10:0:0:0:0:0:1
- IPV6IPv4

1.3.10

```
<?xml version="1.0" encoding="UTF-8"?>
<dble:user xmlns:dble="http://dble.cloud/">
  <managerUser name="man1" password="654321" whiteIPs="127.0.0.1,0:0:0:0:0:0:1" readOnly="false"/>
  <managerUser name="user" usingDecrypt="true" readOnly="true" password="AqEkFEuIFAX6g2TJQnp4CJ2r7Yc0Z4/KBsZqKhT8qSz18Aj91e8lx049BKQE1C6
  0FFw4c38pCYa8QGFTub7pnw==" />

  <shardingUser name="root" password="123456" schemas="testdb" readOnly="false" blacklist="blacklist1" maxCon="20"/>
  <shardingUser name="root2" password="123456" schemas="testdb,testdb2" maxCon="20" tenant="tenant1">
    <privileges check="true">
      <schema name="testdb" dml="0110">
        <table name="tb01" dml="0000"/>
        <table name="tb02" dml="1111"/>
      </schema>
    </privileges>
  </shardingUser>
  <!--rwSplitUser not work for now-->
  <rwSplitUser name="rwsu1" password="123456" dbGroup="dbGroup1" blacklist="blacklist1"
    maxCon="20"/>

  <analysisUser name="analysisUser" password="123456" dbGroup="dbGroup3" maxCon="20"/>

  <hybridTAUser name="hysu1" password="111111" schemas="testdb3" maxCon="20"/>
  <hybridTAUser name="hysu2" password="111111" schemas="testdb3" maxCon="20" blacklist="blacklist1" tenant="tenant2">
    <privileges check="true">
      <schema name="testdb3" dml="0110">
        <table name="tb_global1" dml="0000"/>
        <table name="tb_global2" dml="1111"/>
      </schema>
    </privileges>
  </hybridTAUser>

  <blacklist name="blacklist1">
    <property name="selectAllow">true</property>
  </blacklist>
</dble:user>
```


1.4 db.xml

db.xml,

1.4.1 dbGroup

- dbGroup

	&	/	
name			dbGroup
rwSplitMode		0/1/2/3	0, 1 2 3
delayThreshold		-1	1:delayThresholdshow slave status 2:delayPeriodMillisdelayDatabase delay_detection 3:delayThreshold=-1 4:delayPeriodMillisdelayDatabase12
delayPeriodMillis		-1	delayThresholddelayDatabase
delayDatabase	mysqldatabase	null,	mysqsqlmysqldatabase delayThresholddelayPeriodMillis
disableHA		true/falsefalse	
heartbeat	,		mysql. : 1.select 1 2. select @@read_only 3.show slave status, Seconds_Behind_Mastermysql
dbInstance			

- heartbeat

	&	/	
timeout	heartbeat,	0	dble heartbeatPeriodMillis dbInstance ,timeout (heartbeatPeriodMillis)22s4s 4stimeout(2. dbtimeout
errorRetryCount	heartbeat,	10	/,errorRetryCount 1. errorOK() 2. okerror 3.
keepAlive	heartbeat,	60	dbleheartbeatPeriodMillisdbInstance,, (+heartbeatPeriodMillis+keepAlive) (heartbeatPeriodMillis)101310 00131120131000 + 10s + 60s

- dbInstance

	&	/	
name			
id	id	name	id
url	ip:port		IPPORT
user			
password			
usingDecrypt	password	false/true,false	truepassworddecrypt.sh 1:{name}: {user}:{password}
minCon			minCon dbGroupshardingNode numOfShardingNodesminCon numOfShardingNodes numOfShardingNodes
			maxCon dbGroupshardingNode

maxCon			numOfShardingNodes, minCon maxCon numOfShardingNodes minCon ,
readWeight	0		0 0. 0
primary	true	false	
disabled		false	
databaseType		,mysql	mysqlmysqlclickhouseclickhouse, + mysqlshardingUserrwSplitUser + clickhouseanalysisUserapNode hybridTAUser, dbGroupdbInstance databaseType + clickHousedb.xmlclickHouse db.xmlmysqllower_case_table_names 0
property			
dbDistrict	mysql		bootstrap.cnfdistrict
dbDataCenter	mysql		bootstrap.cnfdataCenter

- property

:

```

<?xml version="1.0"?>
<dble:db xmlns:dble="http://dble.cloud/">

<dbGroup name="dbGroup1" rwSplitMode="1" delayThreshold="10000">
    <heartbeat errorRetryCount="1" timeout="10" keepAlive="60">show slave status</heartbeat>
    <dbInstance name="instanceM1" url="ip4:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="true">
        <property name="testOnCreate">false</property>
        <property name="testOnBorrow">false</property>
        <property name="testOnReturn">false</property>
        <property name="testWhileIdle">true</property>
        <property name="connectionTimeout">30000</property>
        <property name="connectionHeartbeatTimeout">20</property>
        <property name="timeBetweenEvictionRunsMillis">30000</property>
        <property name="idleTimeout">600000</property>
        <property name="heartbeatPeriodMillis">10000</property>
        <property name="evictorShutdownTimeoutMillis">10000</property>
    </dbInstance>

    <!-- can have multi read instances -->
    <dbInstance name="instanceS1" url="ip5:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="false">
        <property name="heartbeatPeriodMillis">60000</property>
    </dbInstance>
</dbGroup>
<dbGroup name="dbGroup2" rwSplitMode="1" delayThreshold="1000" delayPeriodMillis="2000" delayDatabase="test">
    <heartbeat errorRetryCount="1" timeout="10" keepAlive="60">show slave status</heartbeat>
    <dbInstance name="instanceM2" url="ip5:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="true">
    </dbInstance>

    <!-- can have multi read instances -->
    <dbInstance name="instanceS2" url="ip6:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="false">
        <property name="heartbeatPeriodMillis">60000</property>
    </dbInstance>
</dbGroup>
</dble:db>

```

1.4.2 MySQL

dble MySQL

SELECT	
INSERT	
UPDATE	
DELETE	
FILE	load data

CREATE	()
DROP	
ALTER	
LOCK TABLES	lock tables
ALTER ROUTINE	(hint)/
CREATE ROUTINE	(hint)
EXECUTE	(hint)
INDEX	/
SUPER	KILL
SHOW DATABASES	GUINFORMATION_SCHEMA SCHEMATA
PROCESS	show processlist
REPLICATION CLIENT	: 1., 2.show slave status 3.show @@binlog_status
REFERENCES	()
XA_RECOVER_ADMIN	mysql8.0mysqlXA_RECOVER_ADMIN

1.5 sharding.xml

1.5.1 XML

- schema (schema)
- shardingNode ()
- apNode (ap)
- function ()

1. user.xmlshardingUserhybridTAUserdblesharding.xml(dble)sharding.xml

1.5.2 schema

- schema

		/	
name	schema		schema
shardingNode			xmltable 1tableschema 2schematabledefault single table 3(function)schematabledefault sharding table1.13 Schema
function	sharding table		function(shardingNodefunction) 1.13 Schema
apNode	OLAP(clickHouse)		apNodeOLAP 0apNode 1shardingUserschemaapNode 2hybridTAUserschemaapNode
sqlMaxLimit		-1	SQL 1 (order/group/) 2 schemasqlMaxLimit
logicalCreateADrop		true	trueschema
shardingTable	shardingTable		
globalTable	globalTable		
singleTable	singleTable		

- shardingTable

		/	
name			,
shardingNode			xxx\$n0-n1 xxxn0, ..., xxxnm, ..., xxxn1 dn\$1-6 dn1,dn2, dn3,dn4,dn5,dn6
shardingColumn			
function			function
incrementColumn			
sqlMaxLimit		schemasqlMaxLimit	schemas schema
sqlRequiredSharding	sql	false	truesql
specifyCharset	dbleISO-8859-1	false	true,dbleISO-8859-1
childTable	childTable		ER

- childTable

		/	
name			,
joinColumn	joinjoin		
parentColumn	joinjoin		/
incrementColumn			
sqlMaxLimit		schemasqlMaxLimit	schemas schema
specifyCharset	dbleISO-8859-1	false	true,dbleISO-8859-1

childTable	childTable		ER
<ul style="list-style-type: none"> • globalTable 			
name		/	,
shardingNode			xxx\$n0-n1 xxxn0, ..., xxxnm, ..., xxxn1 dn\$1-6 dn1, dn2, dn3, dn4, dn5, dn6
sqlMaxLimit		schemasqlMaxLimit	schemas schema
specifyCharset	dbleISO-8859-1	false	true, dbleISO-8859-1
checkClass			dbleCHECKSUMCOUNT
cron		0 0 0 * * ?	quartz http://www.quartz-scheduler.org/api/2.4.0-SNAPSHOT/org/quartz/CronScheduleBuilder.html
<ul style="list-style-type: none"> • singleTable 			
name		/	,
shardingNode			shardingNode
sqlMaxLimit		schemasqlMaxLimit	schemas schema
specifyCharset	dbleISO-8859-1	false	true, dbleISO-8859-1

1.5.3 shardingNode

- shardingNode

	&	
name	"dn, dn\$0-5"	, ',', X()05, "X\$0-5", \$name databasedbGroup shadingNodeapNodename
database	shardingNodemysqlschema, "db, db\$0-5"	, ',', X()05, "X\$0-5", \$
dbGroup	shardingNodedb.xmldbGroup, "dh, dh\$0-5"	Host, ',', X()05, "X\$0-5", \$

```

<shardingNode name="dn1" dbGroup="localhost1" database="db1" />

name, dbGroup, database      xxx$n0-n1, xxx, xxxn0... , xxxnm ... ,xxxn1, xxx,
                            n0 < nm < n1

:
<shardingNode name="dn1$0-19" dbGroup="localhost1$0-9" database="db1$0-1" />
<shardingNode name="dn10" dbGroup="localhost10" database="db10" />
<shardingNode name="dn11" dbGroup="localhost10" database="db11" />
<shardingNode name="dn12" dbGroup="localhost11" database="db10" />
<shardingNode name="dn13" dbGroup="localhost11" database="db11" />
...
<shardingNode name="dn119" dbGroup="localhost19" database="db11" />

```

shardingNode(name)dbGroupdatabase,,name20,dbGroup10,database2;

```
<shardingNode name="dn, dn1$0-19, dnx" dbGroup="localhost, localhost1$0-9" database="db1$0-1" />
```

,name22,dbGroup11,database2

shardingNodedatabasedbGroup(shardingNode)shardingNodenameapNode

1.5.4 apNode

- apNode

apNodeshardingNode

	&	
name	"dn,dn\$0-5"	,,’,X()05,"X\$0-5",\$name databasedbGroup apNodeshardingNodename
database	apNodeclickHouseschema,"db,db\$0-5"	,,’,X()05,"X\$0-5",\$
dbGroup	apNodedb.xmldbGroup,"dh,dh\$0-5"	Host,’,X()05,"X\$0-5",\$ dbGroupdatabaseTypeclickhouse

<apNode name="apNode1" dbGroup="localhost1" database="ap_db1" />

name, dbGroup, database xxx\$n0-n1, xxx, xxxx0... , xxxxnm ... ,xxxxn1, xxx,

n0 < nm < n1

<apNode name="apNode1\$0-19" dbGroup="localhost1\$0-9" database="ap_db1\$0-1" />

:

<apNode name="apNode10" dbGroup="localhost10" database="ap_db10" />
<apNode name="apNode11" dbGroup="localhost10" database="ap_db11" />
<apNode name="apNode12" dbGroup="localhost11" database="ap_db10" />
<apNode name="apNode13" dbGroup="localhost11" database="ap_db11" />
...
<apNode name="apNode119" dbGroup="localhost19" database="ap_db11" />

apNode(name)dbGroupdatabase,,name20,dbGroup10,database2;

<apNode name="dn,dn1\$0-19,dnx" dbGroup="localhost,localhost1\$0-9" database="db1\$0-1" />

,name22,dbGroup11,database2

apNodedatabasedbGroup(apNode)apNodenameshardingNode

1.5.5 function

name: class property name

- function

name		
class		Enum,NumberRange,Hash,StringHash,Date,PatternRange,jumpStringHash
property	function	

<function name="rang-long"" class="com.actiontech.dble.route.function.AutoPartitionByLong">
<property name="mapFile">auto-sharding-long.txt</property>
...
</function>

: hash, stringhash, enum, numberrange, patternrange, datejumpstringhash.

1.5.5.1.hash

function class“hash”“com.actiontech.dble.route.function.PartitionByLong”

<function name="hashLong" class="hash">
<property name="partitionCount">C1[,C2, ...Cn]</property>
<property name="partitionLength">L1[,L2, ...Ln]</property>
</function>

partitionCount: C1 [+C2 + ... + Cn].

partitionLength: [0, L1), [L1, 2L1), ..., [(C1-1)L1, C1L1), [C1L1, C1L1+L2), [C1L1+L2, C1L1+2L2), ...

F1

```
<property name="partitionCount">2,3</property>
<property name="partitionLength">100,50</property>
```

[0 , 100) [100, 200) [200, 250) [250, 300) [300, 350)

,F2:

```
<property name="partitionCount">2</property>
<property name="partitionLength">1000</property>
```

[0 , 1000) [1000, 2000)

MC1 $L1 + \dots + Cn$ Ln. F1 M350F2M2000 keyM

value = key mod M value F1, key = 805 , value = 105, 51(0)

N C1 [+C2 + ... + Cn]. F1 N5F2N2

1. M28802880:2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, 18, 20, 24, 30, 32, 36, 40, 45, 48, 60, 64, 72, 80, 90, 96, 120, 144, 160, 180, 192, 240, 288, 320, 360, 480, 576, 720, 960, 14402880,
2. NshardingNodeshardingNodeshardingNode="dn1,dn2,dn3,dn4" N4
3. CnLn
- 4.
5. partitionLength1hashMNpartitionCount
6. NULL0

1.5.5.2.stringhash

class“stringhash”“com.actiontech.dble.route.function.PartitionByString”

```
<function name="hashString" class="stringhash">
  <property name="partitionCount">C1[,C2, ...Cn]</property>
  <property name="partitionLength">L1[,L2, ...Ln]</property>
  <property name="hashSlice">l:r</property>
</function>
```

partitionCount **partitionLength** hash **hashSlice** hashkey0

hashSlice

1. "0:" "0:0"
2. "0:50" 5050
3. "0:-10" 1010

hashSlice

1.

n	$n \geq 0$	(0,n)
n	$n < 0$	(n,0)
r		(0,r)
l:		(l,0)
:		(0:0)
lr		(l, r)

2.

a.l

1	$l \geq 0$	1		1
1	$l < 0$	$l = l + length$	$l < 0$	$l = 0$

b.r

r	$r > 0$	r	$r > length$	$r = length$
r	$r \leq 0$	$r = r + length$		r

length.

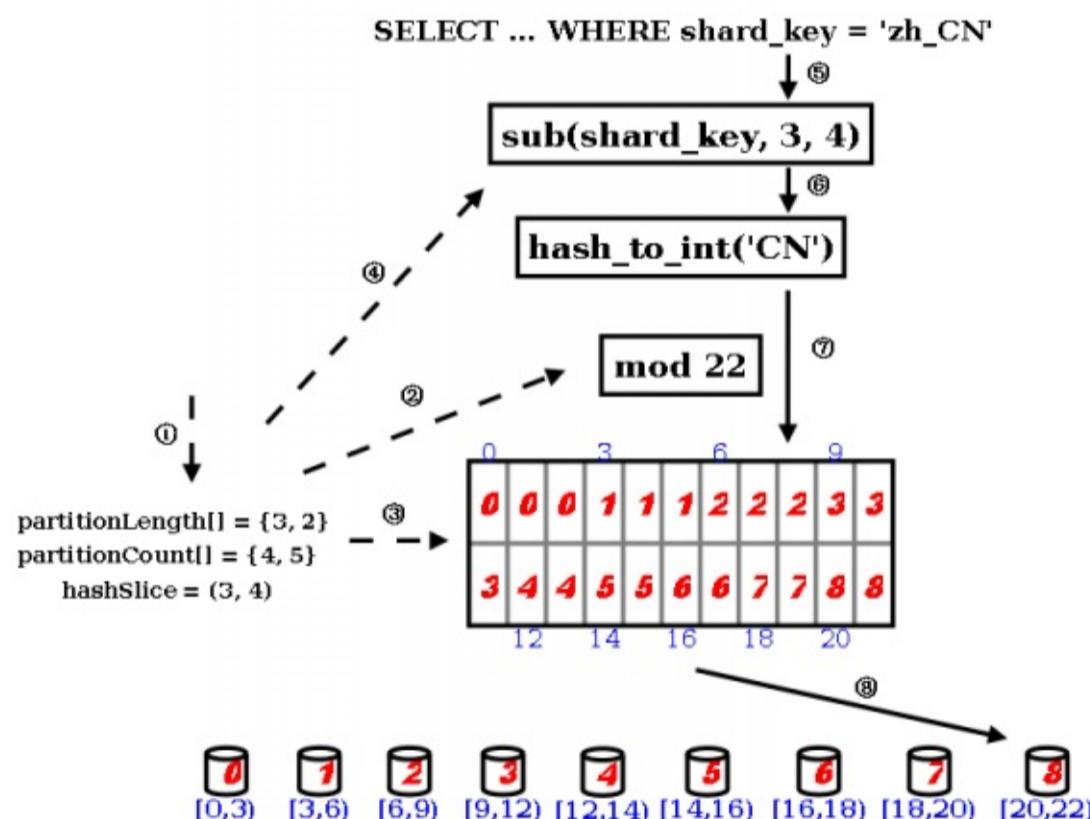
3.

		hash
$l < r$	$[l, r)$	hash
$l \geq r$		0

hash hashhashhash

1. hash(3
- 2.

stringhash unicode hash



- partitionLength[] partitionCount[] hashSlice
- DBLE
- partitionCount[]
- hashSlice 4 5 0 3 4 4 5 “->”
- DBLE WHERE 4 5
- 0 31 unicode “->”
-
-

1.5.5.3.enum

class“enum”“com.actiontech.dble.route.function.PartitionByFileMap”

```
<function name="enum" class="enum">
    <property name="mapFile">partition.txt</property>
    <property name="defaultNode">0</property>
    <property name="type">0</property>
```

</function>

mapFile: **defaultNode-1** **type** typekey0

a. type0

```
#comment //comment this line will be skiped
int1=node0
int2=node1
...
```

b. type0

```
#comment //comment this line will be skiped
string1=node0
string2=node1
...
```

defaultNodedefaultNode

1. “=”.
2. nodeX
- 3.
- 4.
5. NULLdefaultNodedefaultNode;mysqlnot null, "Sharding column can't be null when the table in MySQL column is not null"

1.5.5.4.numberrange

class“numberrange”“com.actiontech.dble.route.function.AutoPartitionByLong”

```
<function name="rangeLong" class="numberrange">
    <property name="mapFile">partition.txt</property>
    <property name="defaultNode">0</property>
</function>
```

mapFile: **defaultNode-1**

#comment //comment this line will be skiped start1-end1=node1 start2-end2=node2 ...

[start1, end1], [start2, end2], ... 1.defaultNodedefaultNode2.defaultNode

1. “=”
2. nodeX
- 3.
- 4.

5. NULLdefaultNodedefaultNode;mysqlnot null, "Sharding column can't be null when the table in MySQL column is not null"

1.5.5.5.patternrange

class“patternrange”“com.actiontech.dble.route.function.PartitionByPattern”

```
<function name="pattern" class="patternrange">
    <property name="mapFile">partition.txt</property>
    <property name="patternValue">1024</property>
    <property name="defaultNode">0</property>
</function>
```

mapFile: **patternValue: 1024 defaultNode-1**

#comment //comment this line will be skiped start1-end1=node1 start1-end2=node2 ...

numberrangepatternValuenumberrange

1. “=”
2. nodeX
- 3.
4. defaultNode defaultNode

5. NULLdefaultNodedefaultNode;mysqlnot null, "Sharding column can't be null when the table in MySQL column is not null"

1.5.5.6.date

```
class“date”“com.actiontech.dble.route.function.PartitionByDate”
```

```
<function name="partbydate" class="date">
    <property name="dateFormat">yyyy-MM-dd</property>
    <property name="sBeginDate">2015-01-01</property>
    [<property name="sEndDate">2015-01-31</property>]
    <property name="sPartitionDay">10</property>
    <property name="defaultNode">0</property>
</function>
```

dateFormat: sBeginDate sEndDate("") sPartitionDay defaultNode-1

1sEndDatesEndDate"" sBeginDate sPartitionDay sBeginDatedefaultNodedefaultNode,
sEndDate N sEndDate1sEndDateindex=((key - sBeginDate)/sPartitionDay)%N, 2sEndDate"" sBeginDate sPartitionDay
key index sBeginDated

1. dateFormat
2. sPartitionDay86400000
3. 2 (sEndDate - sBeginDate)sPartitionDay0
4. NULLdefaultNodedefaultNode;mysqlnot null, "Sharding column can't be null when the table in MySQL column is not null"

1.5.5.7.

```
class"jumpstringhash""com.actiontech.dble.route.function.PartitionByJumpConsistentHash"
```

```
<function name="jumphash"
    class="jumpStringHash">
    <property name="partitionCount">2</property>
    <property name="hashSlice">0:2</property>
</function>
```

partitionCount: hashSlice:1.5.5.2 Google A Fast, Minimal Memory, Consistent Hash Algorithmhash1/n

1. NULL0;mysqlnot null, "Sharding column can't be null when the table in MySQL column is not null"
2. hashSlice, 3.21.020:-1,3.21.060:0

1.5.6

```
<?xml version="1.0"?>
<!--
~ Copyright (C) 2016-2020 ActionTech.
~ License: http://www.gnu.org/licenses/gpl.html GPL version 2 or higher.
-->

<dble:sharding xmlns:dble="http://dble.cloud/" version="4.0">

<schema name="testdb" sqlMaxLimit="100">
    <shardingTable name="tb_enum_sharding" shardingNode="dn1,dn2" sqlMaxLimit="200" function="func_enum" shardingColumn="code"/>
    <shardingTable name="tb_range_sharding" shardingNode="dn1,dn2,dn3" function="func_range" shardingColumn="id" specifyCharset= "false"/>
    <!--er tables-->
    <shardingTable name="tb_hash_sharding" shardingNode="dn1,dn2" function="func_common_hash" shardingColumn="id"/>
    <shardingTable name="tb_hash_sharding_er1" shardingNode="dn1,dn2" function="func_common_hash" shardingColumn="id"/>
    <shardingTable name="tb_hash_sharding_er2" shardingNode="dn1,dn2" function="func_common_hash" shardingColumn="id2"/>
    <shardingTable name="tb_hash_sharding_er3" shardingNode="dn1,dn2" function="func_common_hash" shardingColumn="id" incrementColumn="id2"/>
    <shardingTable name="tb_uneven_hash" shardingNode="dn1,dn2,dn3" function="func_uneven_hash" shardingColumn="id"/>
    <shardingTable name="tb_mod" shardingNode="dn1,dn2,dn3,dn4" function="func_mod" shardingColumn="id" sqlRequiredSharding="true"/>
    <shardingTable name="tb_jump_hash" shardingNode="dn1,dn2" function="func_jumpHash" shardingColumn="code"/>
```

```

<shardingTable name="tb_hash_string" shardingNode="dn1,dn2,dn3,dn4" function="func_hashString" shardingColumn="code"/>

<shardingTable name="tb_date" shardingNode="dn1,dn2,dn3,dn4" function="func_date" shardingColumn="create_date"/>

<shardingTable name="tb_pattern" shardingNode="dn1,dn2" function="func_pattern" shardingColumn="id"/>
<!--global tables-->
<globalTable name="tb_global1" shardingNode="dn1,dn2" sqlMaxLimit="103" specifyCharset= "false"/>
<globalTable name="tb_global2" shardingNode="dn1,dn2,dn3,dn4" cron="0 0 0 * * ?" checkClass="CHECKSUM"/>
<!--single node table-->
<singleTable name="tb_single" shardingNode="dn6" sqlMaxLimit="105"specifyCharset= "false"/>
<!--er tables-->
<shardingTable name="tb_parent" shardingNode="dn1,dn2" function="func_common_hash" shardingColumn="id">
    <childTable name="tb_child1" joinColumn="child1_id" parentColumn="id" sqlMaxLimit="201">
        <childTable name="tb_grandson1" joinColumn="grandson1_id" parentColumn="child1_id" specifyCharset= "false"/>
        <childTable name="tb_grandson2" joinColumn="grandson2_id" parentColumn="child1_id2" specifyCharset= "false"/>
    </childTable>
    <childTable name="tb_child2" joinColumn="child2_id" parentColumn="id"/>
    <childTable name="tb_child3" joinColumn="child3_id" parentColumn="id2"/>
</shardingTable>
</schema>
<!-- sharding testdb2 route to database named dn5 in localhost2 -->
<schema name="testdb2" shardingNode="dn5"/>
<shardingNode name="dn1" dbGroup="dbGroup1" database="db_1"/>
<shardingNode name="dn2" dbGroup="dbGroup2" database="db_2"/>
<shardingNode name="dn3" dbGroup="dbGroup1" database="db_3"/>
<shardingNode name="dn4" dbGroup="dbGroup2" database="db_4"/>
<shardingNode name="dn5" dbGroup="dbGroup1" database="db_5"/>
<shardingNode name="dn6" dbGroup="dbGroup2" database="db_6"/>
<!-- enum partition -->
<function name="func_enum" class="Enum">
    <property name="mapFile">partition-enum.txt</property>
    <property name="defaultNode">0</property><!--the default is -1,means unexpected value will report error-->
    <property name="type">0</property><!--0 means key is a number, 1 means key is a string-->
</function>
<!-- number range partition -->
<function name="func_range" class="NumberRange">
    <property name="mapFile">partition-number-range.txt</property>
    <property name="defaultNode">0</property><!--he default is -1,means unexpected value will report error-->
</function>
<!-- Hash partition,when partitionLength=1, it is a mod partition, MAX(sum(count*length[i])) must not more then 2880-->
<function name="func_common_hash" class="Hash">
    <property name="partitionCount">2</property>
    <property name="partitionLength">512</property>
</function>
<!-- Hash partition,when partitionLength=1, it is a mod partition, MAX(sum(count*length[i])) must not more then 2880-->
<function name="func Uneven_hash" class="Hash">
    <property name="partitionCount">2,1</property>
    <property name="partitionLength">256,512</property>
</function>
<!-- eg: mod 4 -->
<function name="func_mod" class="Hash">
    <property name="partitionCount">4</property>
    <property name="partitionLength">1</property>
</function>
<!-- jumpStringHash partition for string-->
<function name="func_jumpHash" class="jumpStringHash">
    <property name="partitionCount">2</property>
    <property name="hashSlice">0:2</property>
</function>
<!-- Hash partition for string-->
<function name="func_hashString" class="StringHash">
    <property name="partitionCount">4</property>
    <property name="partitionLength">256</property>
    <property name="hashSlice">0:2</property>
    <!--<property name="hashSlice">-4:0</property> -->
</function>
<!-- date partition 4 case:
1.set sEndDate and defaultNode: input <sBeginDate ,router to defaultNode; input>sEndDate ,mod the period
2.set sEndDate, but no defaultNode:input <sBeginDate report error; input>sEndDate ,mod the period
3.set defaultNode without sEndDate: input <sBeginDate router to defaultNode;input>sBeginDate + (node size)*sPartitionDay-1 will report e
rror(expected is defaultNode,but can't control now)
4.sEndDate and defaultNode are all not set: input <sBeginDate report error;input>sBeginDate + (node size)*sPartitionDay-1 will report er
ror
-->
<function name="func_date" class="Date">
    <property name="dateFormat">yyyy-MM-dd</property>
    <property name="sBeginDate">2015-01-01</property>
    <property name="sEndDate">2015-01-31</property> <!--if not set sEndDate,then in fact ,the sEndDate = sBeginDate+ (node size)*sPart

```

```
ionDay-1 -->
<property name="sPartitionDay">10</property>
<property name="defaultNode">0</property><!--the default is -1-->
</function>
<!-- pattern partition : mapFile must contains all value of 0~patternValue-1,key and value must be Continuous increase-->
<function name="func_pattern" class="PatternRange">
<property name="mapFile">partition-pattern.txt</property>
<property name="patternValue">1024</property>
<property name="defaultNode">0</property><!--contains string which is not number,router to default node-->
</function>
</dble:sharding>
```

1.6 log4j2.xml

1.6.1

Dbleavalog4j2.xml

1.6.1.1

DefaultRolloverStrategy RollingRandomAccessFileRolloverStrategy

```
<DefaultRolloverStrategy max="100">
    <Delete basePath="logs" maxDepth="2">
        <IfFileName glob="*/dble-*.log.gz">
            <IfLastModified age="2d">
                <IfAny>
                    <IfAccumulatedFileSize exceeds="1 GB" />
                    <IfAccumulatedFileCount exceeds="10" />
                </IfAny>
            </IfLastModified>
        </IfFileName>
    </Delete>
</DefaultRolloverStrategy>
```

```
:
basePath
maxDepth basePathmaxDepth.../logs/2018-01-01           .../logs/2018-01-02
glob
age
IfAccumulatedFileSize
IfAccumulatedFileCount
logs2"          /dble-.log.gz"21 GB10
```

1.6.2

```
<?xml version="1.0" encoding="UTF-8"?>
<Configuration status="WARN" packages="com.actiontech.dble.log">
    <Appenders>
        <Console name="Console" target="SYSTEM_OUT">
            <PatternLayout pattern="%d [%-5p][%t] %m %throwable{full} (%C:%F:%L) %n"/>
        </Console>

        <RollingRandomAccessFile name="RollingFile" fileName="logs/dble.log"
            filePattern="logs/${date:yyyy-MM}/dble-%d{MM-dd}-%i.log.gz">
            <PatternLayout>
                <Pattern>%d{yyyy-MM-dd HH:mm:ss.SSS} %5p [%t] (%l) - %m%n</Pattern>
            </PatternLayout>
            <Policies>
                <OnStartupTriggeringPolicy/>
                <SizeBasedTriggeringPolicy size="250 MB"/>
                <TimeBasedTriggeringPolicy/>
            </Policies>
            <DefaultRolloverStrategy max="100">
                <Delete basePath="logs" maxDepth="2">
                    <IfFileName glob="*/dble-*.log.gz">
                        <IfLastModified age="2d">
                            <IfAny>
                                <IfAccumulatedFileSize exceeds="1 GB" />
                                <IfAccumulatedFileCount exceeds="10" />
                            </IfAny>
                        </IfLastModified>
                    </IfFileName>
                </Delete>
            </DefaultRolloverStrategy>
        </RollingRandomAccessFile>

        <RollingFile name="ThreadChecker" fileName="logs/thread.log"
            filePattern="logs/${date:yyyy-MM}/thread-%d{MM-dd}-%i.log.gz">
            <PatternLayout>
                <Pattern>%d{yyyy-MM-dd HH:mm:ss.SSS} %5p [%t] (%l) - %m%n</Pattern>
            </PatternLayout>
            <Policies>
                <OnStartupTriggeringPolicy/>
                <SizeBasedTriggeringPolicy size="250 MB"/>
            </Policies>
        </RollingFile>
    </Appenders>
</Configuration>
```

```
<TimeBasedTriggeringPolicy/>
</Policies>
<DefaultRolloverStrategy max="10"/>
</RollingFile>
</Appenders>
<Loggers>
<Logger name="ThreadChecker" additivity="false" includeLocation="false">
    <AppenderRef ref="ThreadChecker"/>
</Logger>
<asyncRoot level="debug" includeLocation="true">
    <AppenderRef ref="Console"/>
    <AppenderRef ref="RollingFile"/>
</asyncRoot>
</Loggers>
</Configuration>
```

1.7

dble

cluster.cnf

```
sequenceHandlerType=n
```

sequenceHandlerType

- 1:MySQL offset-step
- 2:(Snowflake)
- 3:(Snowflake)
- 4:offset-step

sharding.xml

: incrementColumn

```
//incrementColumn=pidpid
<shardingTable name="table1" shardingNode="dn1,dn2" function="func_common_hash" shardingColumn="id" incrementColumn="pid"/>
```

```
insert into table1(name) values('test');
insert into table1 set name = 'test';
```

2.2

MySQL

MySQLdbledbledbleID

mysql

```
table1aid,bid,cid,did biddble
insert into table1 values(1,2,3)
sql
insert into table1 set aid = 1,cid = 2,did = 3
```

dbleupdatereplace()

1.7.1 MySQL-offset-step

1.7.1.1 MySQL-offset-step

mysqlsequence_db_conf.properties:

#this is comment

`schema1`.`table1`=node1

`schema1`.`table2`=node1

`schema2`.`table1`=node2

...

schemaXdbledble

tableX dbledble

nodeX

1.7.1.2

mysql **nodeX` schemaX`.`tableX`**

nodeX

a. mysql**nodeX**

mysql ...

b. **nodeX**db(1.5 sharding.xml)

use db;

c. dbseq.sql

source .../dbseq.sql;

d.

INSERT INTO DBLE_SEQUENCE VALUES ('**schemaX`.`tableX`**', 1, 1);

...

1.7.1.3 dbseq.sql

dbseq.sql

```

DROP TABLE IF EXISTS DBLE_SEQUENCE;
CREATE TABLE DBLE_SEQUENCE ( name VARCHAR(64) NOT NULL, current_value BIGINT(20) NOT NULL, increment INT NOT NULL DEFAULT 1, PRIMARY KEY ( name ) ) ENGINE=InnoDB;

-- -----
-- Function structure for `dbe_seq_currval`
-- -----
DROP FUNCTION IF EXISTS `dbe_seq_currval`;
DELIMITER ;
CREATE FUNCTION `dbe_seq_currval`(seq_name VARCHAR(64)) RETURNS varchar(64) CHARSET latin1
DETERMINISTIC
BEGIN
DECLARE retval VARCHAR(64);
SET retval="-1,0";
SELECT concat(CAST(current_value AS CHAR),",",CAST(increment AS CHAR) ) INTO retval FROM DBLE_SEQUENCE WHERE name = seq_name;
RETURN retval ;
END
;;
DELIMITER ;

-- -----
-- Function structure for `dbe_seq_nextval`
-- -----
DROP FUNCTION IF EXISTS `dbe_seq_nextval`;
DELIMITER ;
CREATE FUNCTION `dbe_seq_nextval`(seq_name VARCHAR(64)) RETURNS varchar(64) CHARSET latin1
DETERMINISTIC
BEGIN
DECLARE retval VARCHAR(64);

```

```

DECLARE val BIGINT;
DECLARE inc INT;
DECLARE seq_lock INT;
set val = -1;
set inc = 0;
SET seq_lock = -1;
SELECT GET_LOCK(seq_name, 15) into seq_lock;
if seq_lock = 1 then
SELECT current_value + increment, increment INTO val, inc FROM DBLE_SEQUENCE WHERE name = seq_name for update;
if val != -1 then
UPDATE DBLE_SEQUENCE SET current_value = val WHERE name = seq_name;
end if;
SELECT RELEASE_LOCK(seq_name) into seq_lock;
end if;
SELECT concat(CAST((val - inc + 1) as CHAR),",",CAST(inc as CHAR)) INTO retval;
RETURN retval;
END
;;
DELIMITER ;

-- -----
-- Function structure for `dble_seq_setvals` 

-- -----
DROP FUNCTION IF EXISTS `dble_seq_nextvals`;
DELIMITER ;
CREATE FUNCTION `dble_seq_nextvals`(seq_name VARCHAR(64), count INT) RETURNS VARCHAR(64) CHARSET latin1
DETERMINISTIC
BEGIN
DECLARE retval VARCHAR(64);
DECLARE val BIGINT;
DECLARE seq_lock INT;
SET val = -1;
SET seq_lock = -1;
SELECT GET_LOCK(seq_name, 15) into seq_lock;
if seq_lock = 1 then
SELECT current_value + count INTO val FROM DBLE_SEQUENCE WHERE name = seq_name for update;
IF val != -1 THEN
UPDATE DBLE_SEQUENCE SET current_value = val WHERE name = seq_name;
END IF;
SELECT RELEASE_LOCK(seq_name) into seq_lock;
end if;
SELECT CONCAT(CAST((val - count + 1) as CHAR), ", ", CAST(count as CHAR)) INTO retval;
RETURN retval;
END
;;
DELIMITER ;

-- -----
-- Function structure for `dble_seq_setval` 

-- -----
DROP FUNCTION IF EXISTS `dble_seq_setval`;
DELIMITER ;
CREATE FUNCTION `dble_seq_setval`(seq_name VARCHAR(64), value BIGINT) RETURNS varchar(64) CHARSET latin1
DETERMINISTIC
BEGIN
DECLARE retval VARCHAR(64);
DECLARE inc INT;
SET inc = 0;
SELECT increment INTO inc FROM DBLE_SEQUENCE WHERE name = seq_name;
UPDATE DBLE_SEQUENCE SET current_value = value WHERE name = seq_name;
SELECT concat(CAST(value as CHAR),",",CAST(inc as CHAR)) INTO retval;
RETURN retval;
END
;;
DELIMITER ;

```

1.7.2

bootstrap.cnf cluster.cnf

bootstrap.cnfinstanceId instance id [0,1023]

cluster.cnfsequenceStartTime YYYY-MM-dd HH:mm:ss 2010-10-04 09:42:54

bootstrap.cnfinstanceId dbleble

bigint63

1.7.3

bootstrap.cnf cluster.cnf

bootstrap.cnfinstanceId instance id [0,511] **cluster.cnfsequenceInstanceByZk** trueidzk

cluster.cnfsequenceStartTime YYYY-MM-dd HH:mm:ss 2010-10-04 09:42:54

1. `cluster.cnfsequenceInstanceByZktruezookeeper()` ([1.1 cluster.cnf](#))

2. **bootstrap.cnfinstanceId** double

3. bigint63

1.7.4 offset-step

offset-stepsequence_conf.properties

```
# this is comment
`schema1`.`table1`.MINID=1001
`schema1`.`table1`.MAXID=2000
`schema1`.`table1`.CURID=1000

`schema2`.`table2`.MINID=1001
`schema2`.`table2`.MAXID=20000
`schema2`.`table2`.CURID=1000

schemaXmysqldbble

tableX mysqldbble
```

1. zkMINID MAXID CURID
2. MINIDCURID1 MINID+1
3. MAXID - MINID + 1zookeeper
4. dblezookeeper [1.1 cluster.cnf](#)

1.8 cache

- [1.8.1 cache](#)
- [1.8.2 ehcache](#)

1.8.1 cache

1.8.1.1 dblecache

dblecache

- SQLRouteCacheSQL schema_user_SQL -> RouteResult
- ER_SQL2PARENTIDSQLERjoinColumn(parentColumn)schema:select * from where parentKey = (value of joinColumn) -> shardingNode

1.8.1.2 dblecache

dblecache

- ehcache, ehcachecache
- leveldb leveldbcache
- mapdb MapDBcache
- rocksdbRocksDBcache

1.8.1.3 dblecache

dblecachecacheservice.properties

:

factory.cache_type=cache_type

keyvalue

A.SQL

pool.SQLRouteCache=**type,max_size,expire_seconds**

B.ER

pool.ER_SQL2PARENTID=**type,max_size,expire_seconds**

1.8.1.4 cache

a. #

b. factory.cache_type=cache_typecache cache_typecacheehcacheleveldbmapdb rocksdbcache cache

,

factory.encache=ehcache

pool.SQLRouteCache=encache,10000,1800

pool.ER_SQL2PARENTID=encache,1000,1800

typeehcache

factory.encache=ehcache

factory.leveldb=leveldb

pool.SQLRouteCache=**encache,10000,1800**

pool.ER_SQL2PARENTID=**leveldb,1000,1800**

typeencacheleveldb

c. pool.SQLRouteCache=**type,max_size,expire_seconds**pool.ER_SQL2PARENTID=**type,max_size,expire_seconds**SQLRouteCacheER_SQL2PARENTID **type max_size expire_seconds**

d. **default**

1.8.1.5

- RocksDB cache dble rocksdb dble

1.8.2 ehcache

ehcachecacheservice.propertiesehcache

1.8.2.1 ehcache

dble2.6.11.

1.8.2.2 ehcache

ehcacheehcache.xml

<http://www.ehcache.org/documentation/ehcache-2.6.x-documentation.pdf>

```
<ehcache xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="ehcache.xsd" maxEntriesLocalHeap="1000000000"
maxBytesLocalDisk="50G" updateCheck="false">
    <defaultCache maxElementsInMemory="1000000" eternal="false" overflowToDisk="false" diskSpoolBufferSizeMB="30" maxElementsOn
Disk="10000000" diskPersistent="false" diskExpiryThreadIntervalSeconds="120" memoryStoreEvictionPolicy="LRU"/>
</ehcache>
```

1.dbleehcachedefaultCachecache

2.maxEntriesLocalHeap

0 cacheservice.properties**max_size**cacheservice.properties **max_size**

3.timeToIdleSeconds

cacheservice.properties **expire_seconds**

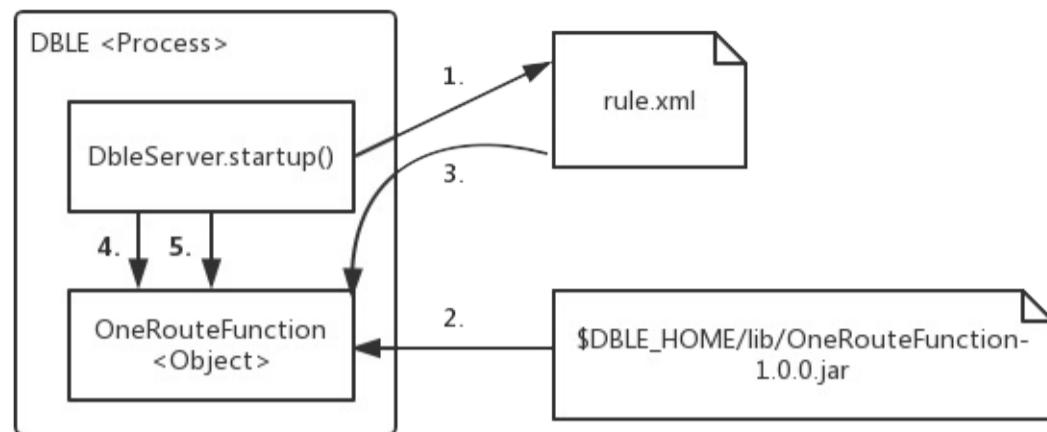
4.dbledefaultCachecache

1.9

1.9.1

1.9.1.1

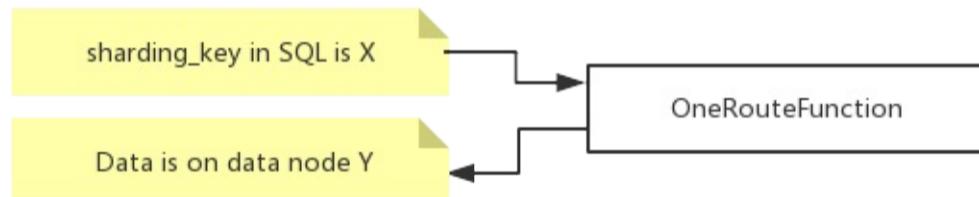
dble



1. dblesharding.xml class
2. dbleJava\$DBLE_HOME/libjarjarclass
3. dblenamesetter—— 2dblesetPartitionCount("2")
4. dbleselfCheck()
5. dbleinit()

1.9.1.2

SQLDBLESQ



1.9.1.3

9066SHOW @@ALGORITHM WHERE SCHEMA=? AND TABLE=?dbegetAllProperties()

```

mysql> show @@algorithm where schema=testdb and table=seqtest;
+-----+-----+
| KEY      | VALUE          |
+-----+-----+
| TYPE     | SHARDING TABLE |
| COLUMN   | ID             |
| CLASS    | com.actiontech.dble.route.function.PartitionByLong |
| partitionCount | 2              |
| partitionLength | 1              |
+-----+-----+
5 rows in set (0.05 sec)
  
```

1.9.2

1.9.2.1

AbstractPartitionAlgorithmRuleAlgorithmAbstractPartitionAlgorithmTableConfigDBLE

DBLE

DBLEDIBLE

1. jarDBLEDIBLE
2. DBLEAbstractPartitionAlgorithmRuleAlgorithmDBLEDIBLE
3. DBLE

1.9.2.2

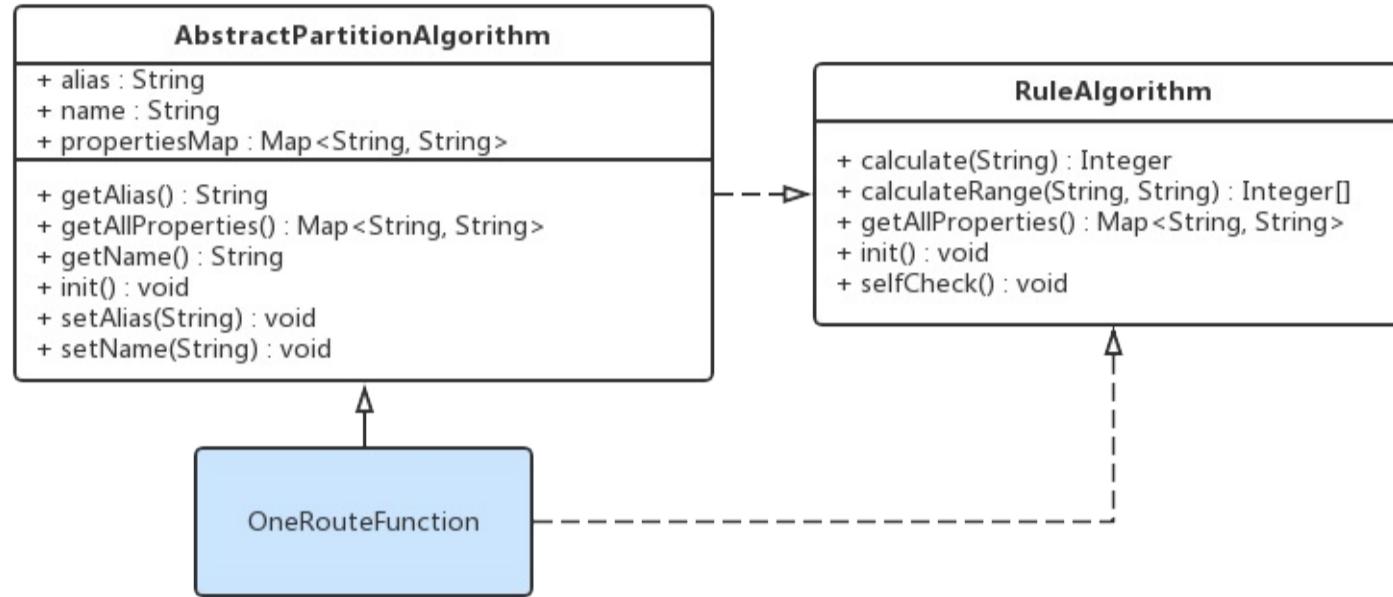
jar classlibraryjarclass

DBLE

1. jar\$DBLE_HOME/lib
2. jarchownchmod\$DBLE_HOME/libjar
3. sharding.xml classFully Qualified Namenet.john.dble.route.functions.NewFunction
4. DBLE

1.9.3

AbstractPartitionAlgorithmRuleAlgorithmcom.actiontech.dble.route.function.PartitionByLong



1.9.3.1 setters

sharding.xmlpartitionCountpartitionLength

```

<function name="hashmod" class="com">
  <property name="partitionCount">4</property>
  <property name="partitionLength">1</property>
</function>
  
```

dblepartitionCount4partitionLength1PartitionByLongsetPartitionCount()setPartitionLength()sharding.xmlXMLStringsetter

```

public void setPartitionCount(String partitionCount) {
    this.count = toIntArray(partitionCount);
    /* getAllProperties() */
    propertiesMap.put("partitionCount", partitionCount);
}

public void setPartitionLength(String partitionLength) {
    this.length = toIntArray(partitionLength);
    /* getAllProperties() */
    propertiesMap.put("partitionLength", partitionLength);
}
  
```

1.9.3.2 selfCheck()

dbleselfCheck()RuntimeExceptiondbleRuntimeExceptiondble

selfCheck()RuleAlgorithmAbstractPartitionAlgorithm

```

@Override
public void selfCheck() {
}
  
```

1.9.3.3 init()

dbleinit()

PartitionByLonginit()PartitionUtil

```

@Override
public void init() {
    partitionUtil = new PartitionUtil(count, length);

    initHashCode();
}
  
```

1.9.3.4 calculate()calculateRange()

dbledSQLcalculate()calculateRange()SQL

IPOInput-Process-Outputcalculate()calculateRange()

- InputSQL
- OutputSQL
- ProcessInputOutput

calculate()calculateRange()

		Input	Output
calculate()	SQL ... WHERE sharding_key = 1	1String	1Integer
calculateRange()	SQL ... WHERE sharding_key BETWEEN 1 AND 5	2String	Integer

```

@Override
public Integer calculate(String columnValue) {
    try {
        if (columnValue == null || columnValue.equalsIgnoreCase("NULL")) {
            return 0;
        }
        long key = Long.parseLong(columnValue);
        return calculate(key);
    } catch (NumberFormatException e) {
        throw new IllegalArgumentException("columnValue:" + columnValue + " Please eliminate any quote and non number within it.", e);
    }
}

@Override
public Integer[] calculateRange(String beginValue, String endValue) {
    long begin = 0;
    long end = 0;
    try {
        begin = Long.parseLong(beginValue);
        end = Long.parseLong(endValue);
    } catch (NumberFormatException e) {
        return new Integer[0];
    }
    int partitionLength = partitionUtil.getPartitionLength();
    if (end - begin >= partitionLength || begin > end) { //TODO: optimize begin > end
        return new Integer[0];
    }
    Integer beginNode = calculate(begin);
    Integer endNode = calculate(end);

    if (endNode > beginNode || (endNode.equals(beginNode) && partitionUtil.isSingleNode(begin, end))) {
        int len = endNode - beginNode + 1;
        Integer[] re = new Integer[len];

        for (int i = 0; i < len; i++) {
            re[i] = beginNode + i;
        }
        return re;
    } else {
        int split = partitionUtil.getSegmentLength() - beginNode;
        int len = split + endNode + 1;
        if (endNode.equals(beginNode)) {
            //remove duplicate
            len--;
        }
        Integer[] re = new Integer[len];
        for (int i = 0; i < split; i++) {
            re[i] = beginNode + i;
        }
        for (int i = split; i < len; i++) {
            re[i] = i - split;
        }
        return re;
    }
}

```

1.9.3.5 getAllProperties()

dbledblegetAllProperties()<, >

```
getAllProperties()RuleAlgorithmAbstractPartitionAlgorithmpropertiesMap“propertiesMap”getAllProperties()setters<, >put()propertiesMap
```

```
@Override
public Map<String, String> getAllProperties() {
    return propertiesMap;
}
```

1.9.4

DBLEcom.actiontech.dble.route.functionsharding.xmlXMLRuleLoader7

date	PartitionByDate
enum	PartitionByFileMap
hash	PartitionByLong
jumpstringhash	PartitionByJumpConsistentHash
numberrange	AutoPartitionByLong
patternrange	PartitionByPattern
stringhash	PartitionByString

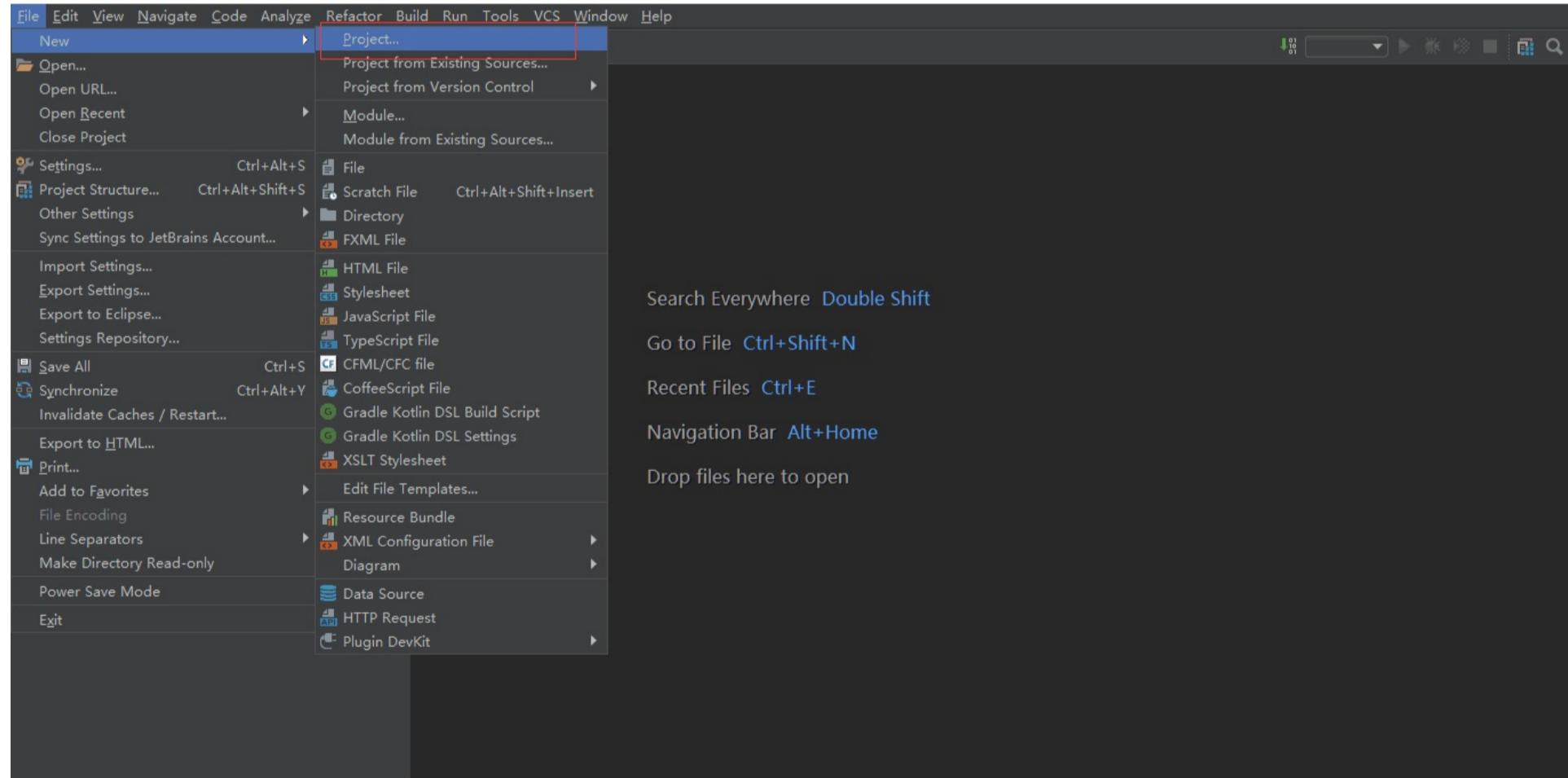
1.9.5 IntelliJ IDEA

1.9.5.0

1. java
2. dblereleasejar2.19.05.0 <https://github.com/actiontech/dble/releases/download/2.19.05.0%2Ftag/actiontech-dble-2.19.05.0.tar.gzlibdblejar>

1.9.5.1 java

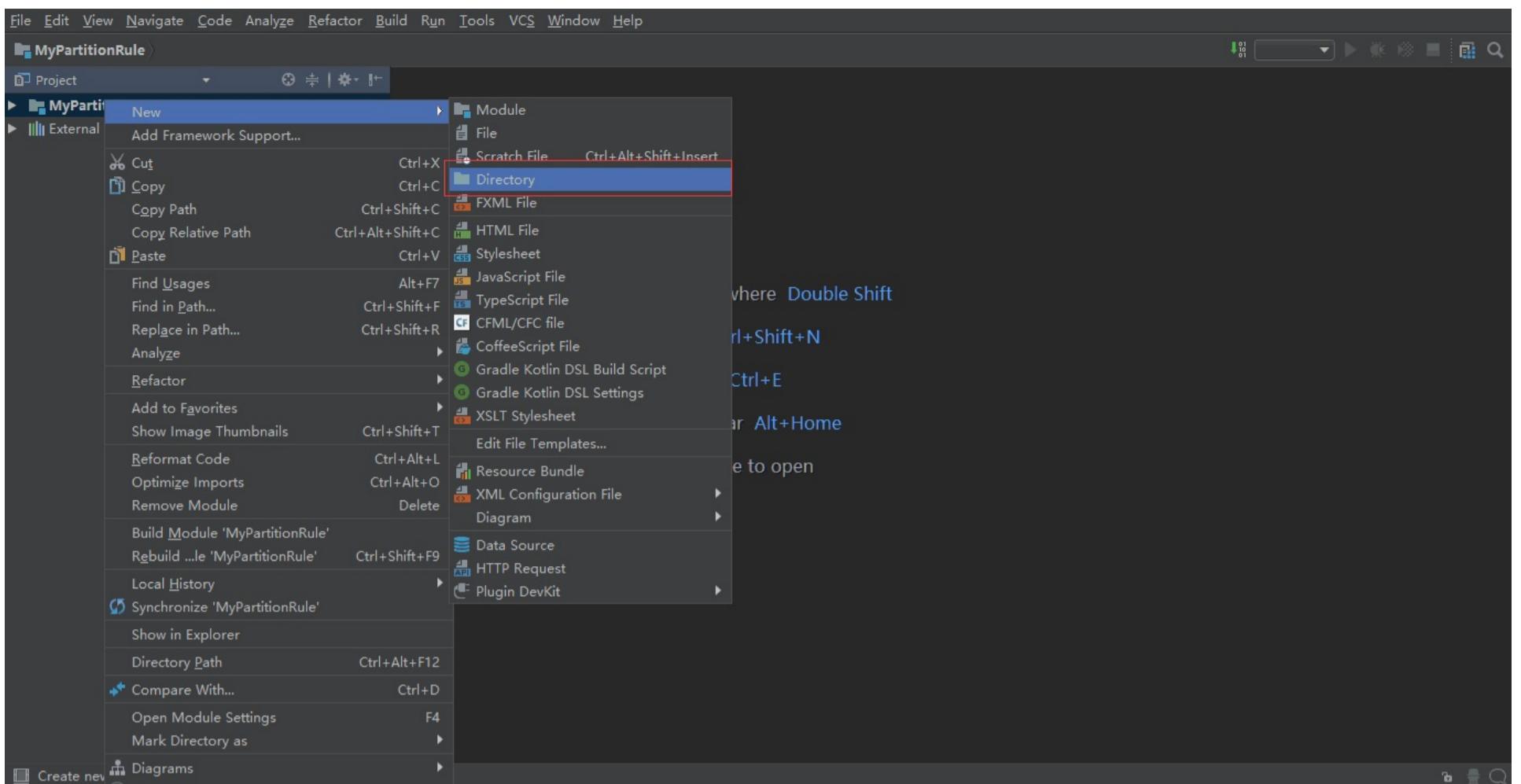
javaProject



Projectjavanext

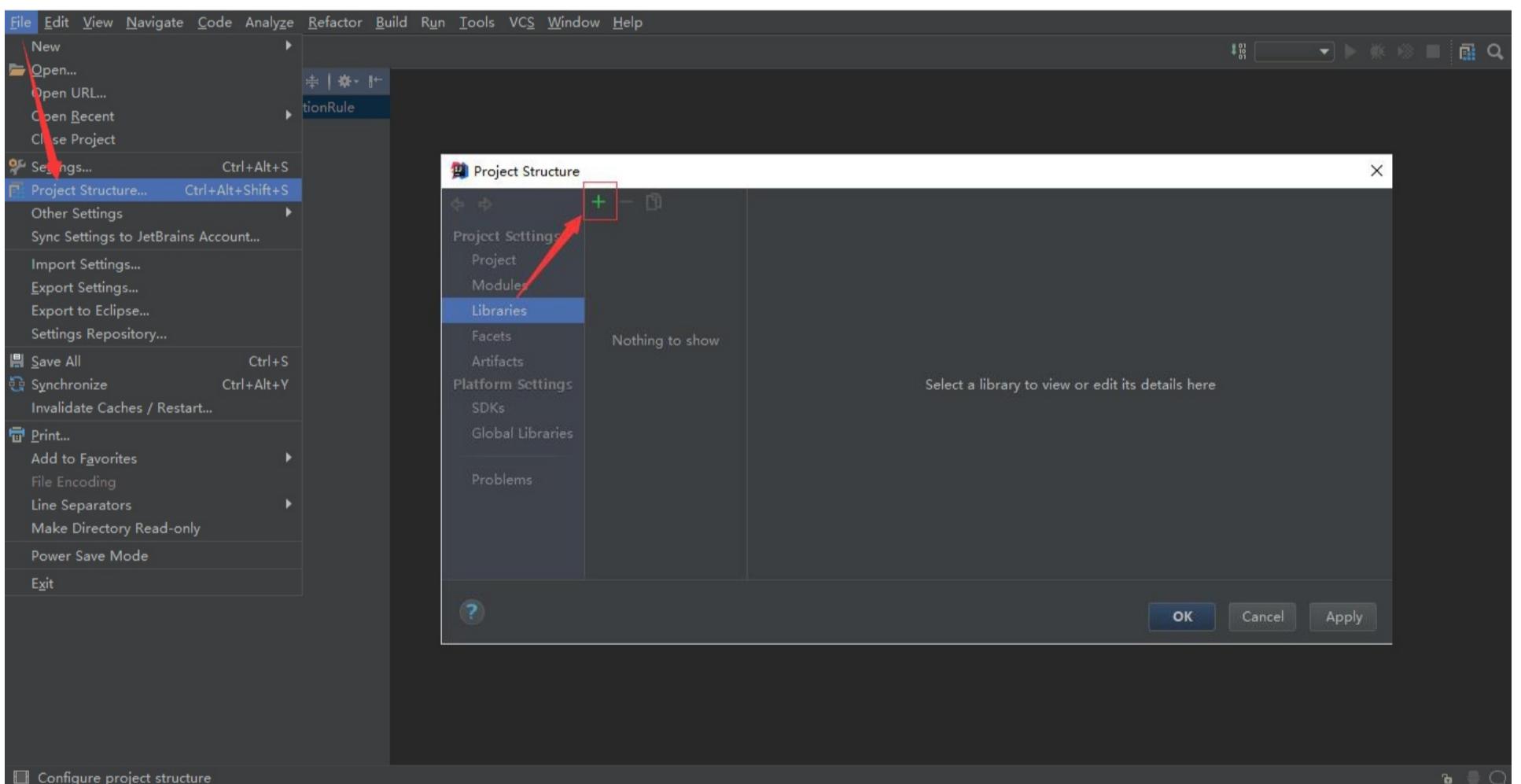
1.9.5.2 dble jar

javalib



double jarlib

libdble jar

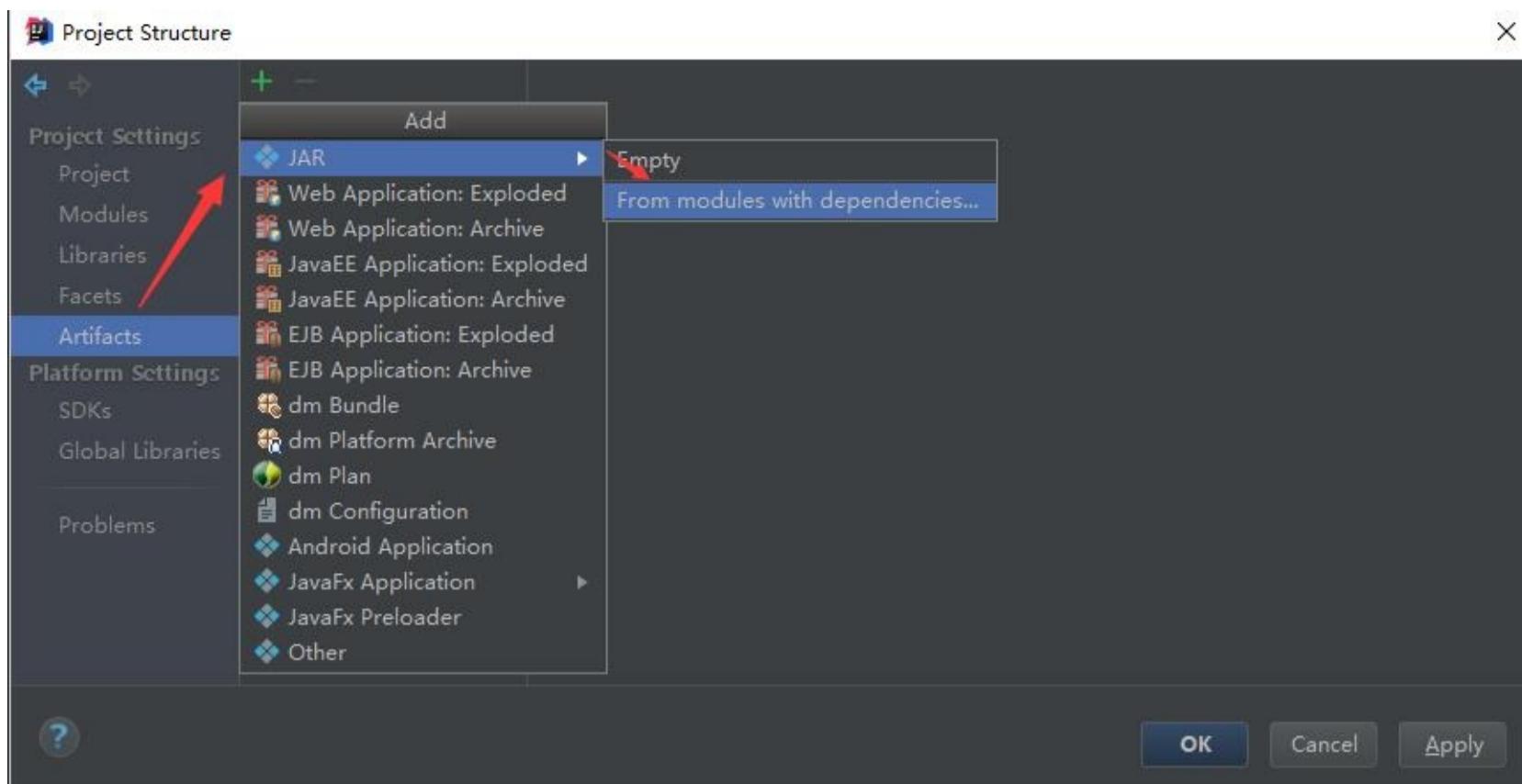


lib

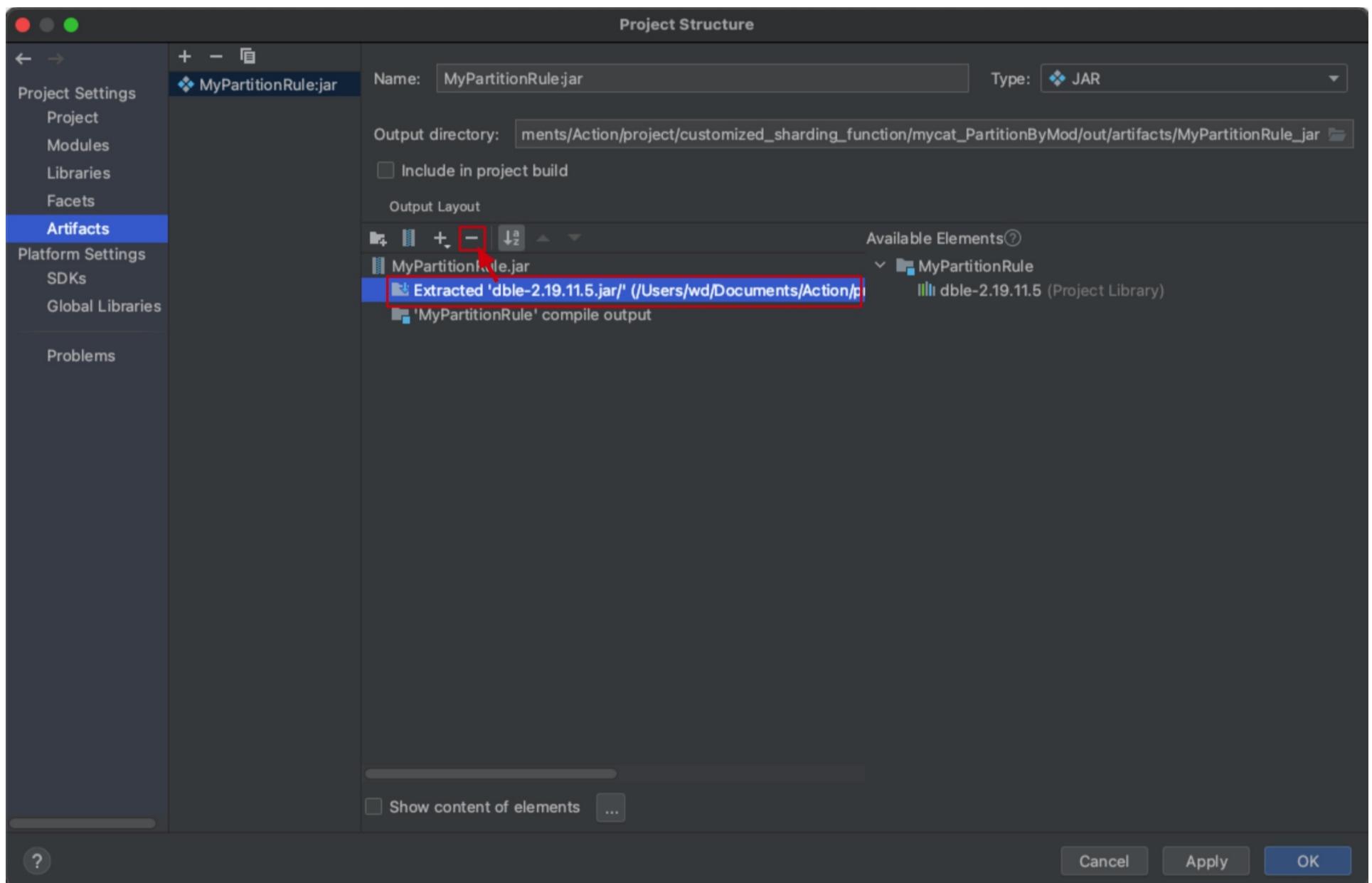
1.9.5.3

1.9.5.4 Artifacts

Project StructureArtifactsOK

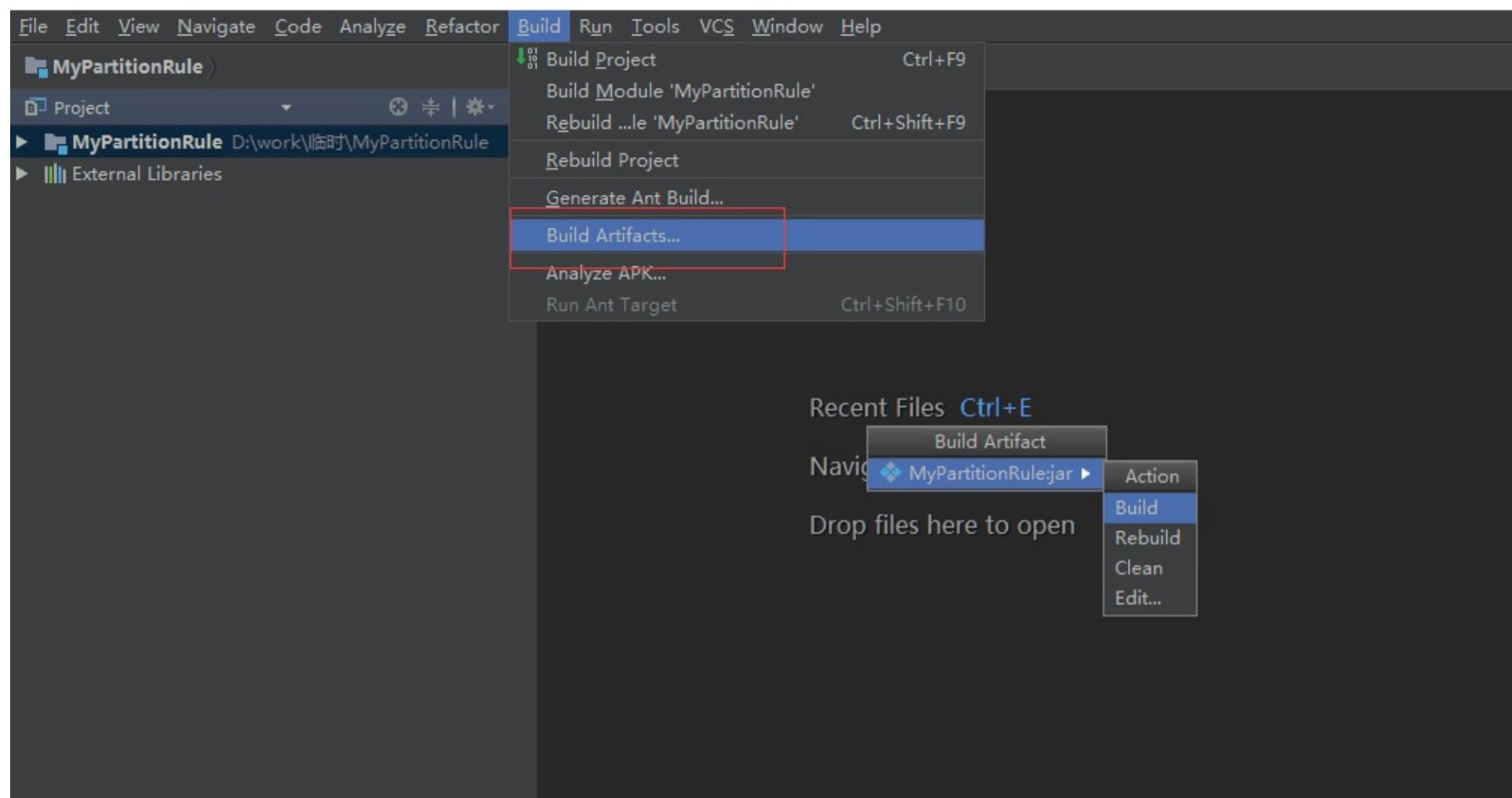


1.9.5.5 Artifactsdble jardble jarApply/ok



1.9.5.6 jar

BuildBuild ArtifactsArtifactbuild



out/artifatjar

1.10

- [3.23.08.0](#)
 -
 -
 - [sql_log](#)
- [3.23.04.0](#)
 -
- [3.22.11.0](#)
 -
- [3.22.01.0](#)
 -
 - [dble_db_instance](#)
- [3.21.06.0](#)
 -
 -
 -
 - [dble_thread_pool](#)
- [3.21.02.0](#)
 - [sequence](#)
 -
 -
- [3.20.07.0](#)
 -

3.23.08.0

1

1.1 bootstrap.cnf

1.1.1 sql

	useSqlStat	3.23.08		useSqlStat=0 samplingRate=0 useSqlStat=1 samplingRate=100
	bufferUsagePercent	3.23.08		80%sqluseSqlStat=1
	clearBigSQLResultSetMapMs	3.23.08		sqluseSqlStat=1 bufferUsagePercent
	sqlRecordCount	3.23.08		show @@sql.slow useSqlStat=1
	samplingRate	3.23.08		0100; 100%sqlsql_log
	enableStatisticAnalysis	3.23.08		show @@sql.sum.usershow @@sql.sum.tablesshow @@sql.condition

2

2.1 sqlshow

```
show @@sqlshow @@sql.highshow @@sql.slow show@@sql.largeshow @@sql.resultSetshow @@sql.sum.usershow @@sql.sum.tableshow @@sql.condition;
reload @@sqlslow=?reload @@user_stat;
```

- 1. 8show useSqlStat samplingRate sql_log
 2. show @@sqlshow @@sql.highshow @@sql.slow show@@sql.largeshow @@sql.resultSet show @@sql1024sqlshow @@sql.high, 1024sql5 N1024sql
 3. show @@sqlshow @@sql.highshow @@sql.slow show@@sql.largeshow @@sql.resultSet true: show @@sql true; reload @@user_stat
 4. show @@sql.slow reload @@sqlslow=?
- - show @@sqlshow @@sql.highshow @@sql.slow show@@sql.largeshow @@sql.resultSet;

1. 5sql_logsql_log samplingRate sqlLogTableSize show @@sql.xx
2. sqlLogTableSize sql_log1024show @@sql.xxsq_logshow @@sql.xx1024
3. show @@sql.xx true; truncate sql_log
4. show @@sql.slow sqlSlowTime reload @@slow_query.time=?;
- show @@sql.sum.usershow @@sql.sum.tableshow @@sql.condition
1. enableStatisticAnalysis , enable/disable @@statisticAnalysis 3show3sql_log

3 sql_log

result_size

3.23.04.0

1

dble3.23.04.0fakeMySQLVersion(in bootstrap.cnf)

Mysql,

MySQL

MySQL5.7.20<=<8.0.0>=8.0.3

- 1.fakeMySQLVersion5.7.20 mysql-version5.7.25
- 2.fakeMySQLVersion8.0.3 mysql-version8.0.23
- 3.fakeMySQLVersion5.7.15 mysql-version8.0.1

3.22.11.0

1

1.1 db.xml

	delayThreshold	3.22.11		

3.22.01.0

1

BusinessExecutorfrontWorkerbackendBusinessExecutorbackendWorkercomplexQueryExecutorcomplexQueryWorker writeToBackendExecutorwriteToBackendWorker
 BusinessExecutor0-frontWorkerbackendBusinessExecutor0-backendWorker writeToBackendExecutor0-writeToBackendWorker\$_NIO_REACTOR_FRONT-00-NIOFrontRW\$_NIO_REACTOR_BACKEND-00-NIOBackendRW

1. show @@threadpool;
2. show @@threadpool.task;
3. show @@thread_used;

2 dble_db_instance

- database_typedbInstance

3.21.06.0

1 dble

1.1 bootstrap.cnf

	inSubQueryTransformToJoininjoin	3.21.06	
	enableCursor false	3.21.06	

inSubQueryTransformToJoin

sqlinjoindbeinjoin

injoininjoinbootstrap.cnf-DinSubQueryTransformToJoin=true

injoin

enableCursor

client

client server server

prepared statement 4.4 prepared statement.

1.2 sharding.xml

	jumpStringHashhashSlice	3.21.06	

hashSlice, 0:-1,1.5 stringhash

3.21.060:0

jumpStringHash hashSlice,0:-1

2

dble3.21.06.0

zkvalue

zkvaluejson

```
{
  "instanceName": "1", //bootstrap.cnf instanceName
  "apiVersion": 1, //
  "createdAt": 1628669627058, //
  "data": { ... } // json
}
```

dble" /{rootPath}/{clusterId} "clusterId

rootPathclusterId cluster.cnf

dble "you may use old incompatible metadata."

3

1. log @@[file=logfile limit=numberOfRow key=keyword regex=regex]
2. show @@syslog limit=?
3. file @@list
4. file @@show filename
5. file @@upload filename content

4 dble_thread_pool

- sizepool_size
- core_pool_size

3.21.02.0

1 sequence

dble3.21.02.0

zksequencekey-valuekeyvalue

zksequencekey-valuekeyvaluejson

sequence(rootPath/clusterId/conf/sequences) ZK

2 dble

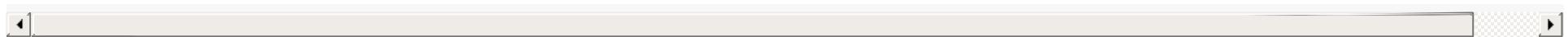
3.21.02.0dblexml

dtdxml dbleDocumentBuilderxml

xsdxml dblejaxb2.0xml

xmlDb.xml

```
<!DOCTYPE dble:db SYSTEM "db.dtd">sharding.xml<!DOCTYPE dble:sharding SYSTEM "sharding.dtd">user.xml<!DOCTYPE dble:user SYSTEM "user.dtd">
```



3 dble

3.1 bootstrap.cnf

	homePath	3.21.02	bootstrap.cnf homePath=DhomePath=.

3.20.07.0

1

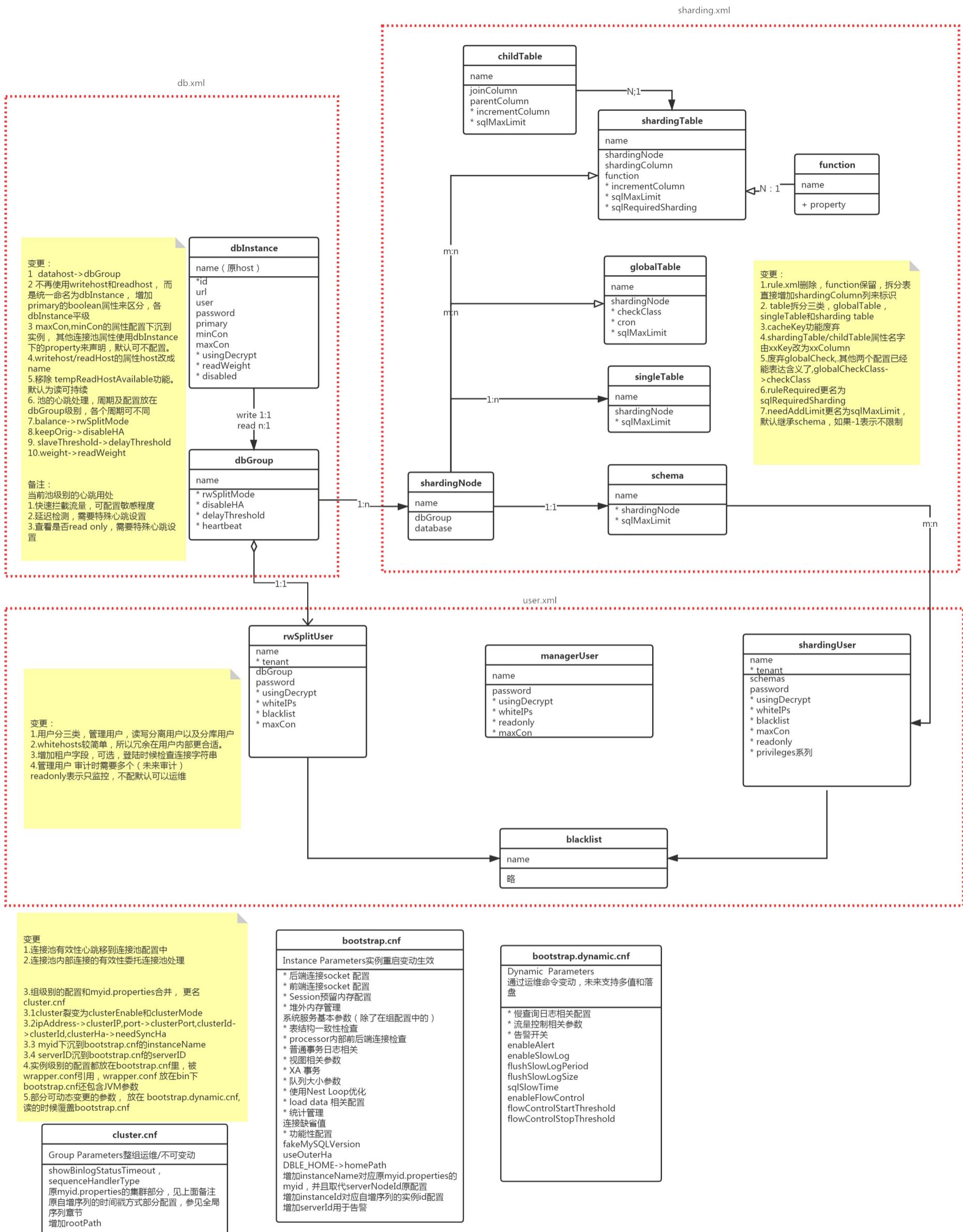
dble 3.20.07.0 [2.20.04.0](#)

[dble_update_config](#) 2.20.04.0 3.20.07.02.20.04.0

```
dble_update_config [-i=read_dir] [-o=write_dir] [-p=rootPath]
```

```
read_dir/write_dir: rootPath:zk,          /dble , ucore,      universe/dble
:
myid.properties
wrapper.conf
server.xml
schema.xml
rule.xml
log4j2.xml
cacheservice.properties(option)
sequence_distributed_conf.properties for type3 (option)
sequence_time_conf.properties for type2 (option)

:
cluster.cnf
bootstrap.cnf
user.xml
db.xml
sharding.xml
log4j2.xml
cacheservice.properties(option)
```

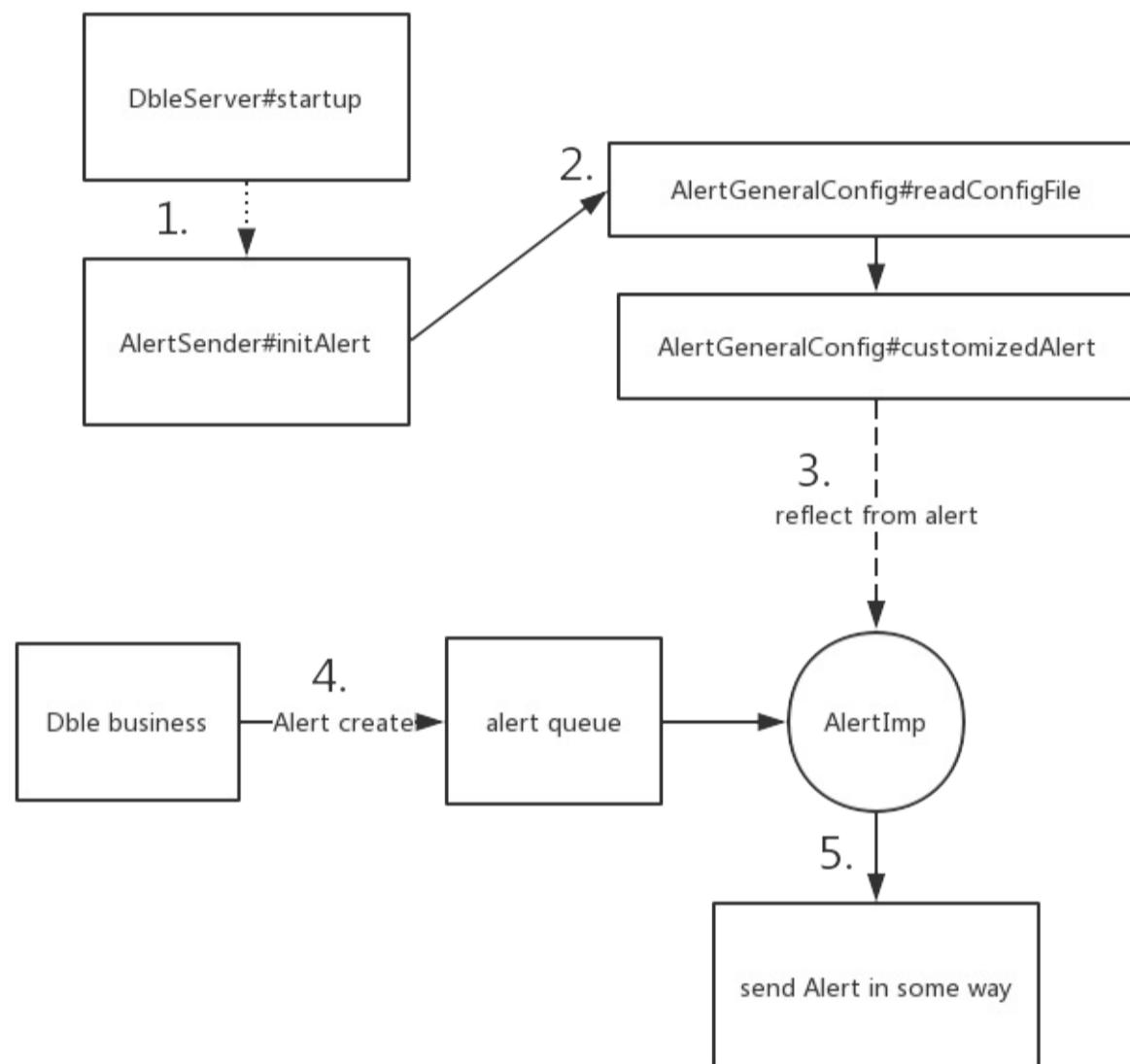


1.11

- -
 -
 - Interface Alert
 -
 -
 -
 -
 -
-
-

1.11.1

1.11.1.1



dble

1. dble
2. AlertGeneralConfigdble_alert.properties
3. alert
4. dble
5. dble

1.11.1.2

dble

-
-

“”dbleXA
“”dblexa

dble

- dble
- dble

“dbe”dbekill “dbe”dbe

dble

- -dbe
- -dbe
- -dbe
- -dbe

dble

- dble
- dble
- dble
- dble

1.11.1.3 Interface Alert

```
public interface Alert {
    void alertSelf(ClusterAlertBean bean);
    void alert(ClusterAlertBean bean);
    boolean alertResolve(ClusterAlertBean bean);
    boolean alertSelfResolve(ClusterAlertBean bean);
    void alertConfigCheck() throws Exception;
}
```

alertConfigCheck

- alert --- dble
- alertSelf --- dble
- alertResolve --- dble
- alertSelfResolve --- dble

dble

alertSelfalertClusterAlertBeanalertComponentTypealertComponentIdalertSelfDBLEserverAlert alertResolvealertSelfResolve

1.11.1.4

```
public class ClusterAlertBean {
    String code;          //
    String level;         //
    String desc;          //
    String sourceComponentType; //
    String sourceComponentId; //ID
    String alertComponentType; //
    String alertComponentId; //ID
    String serverId;      //ID
    long timestampUnix;   //
    long resolveTimestampUnix; //
    Map<String, String> labels; //
}
```

dble

1.11.2

1.11.2.1

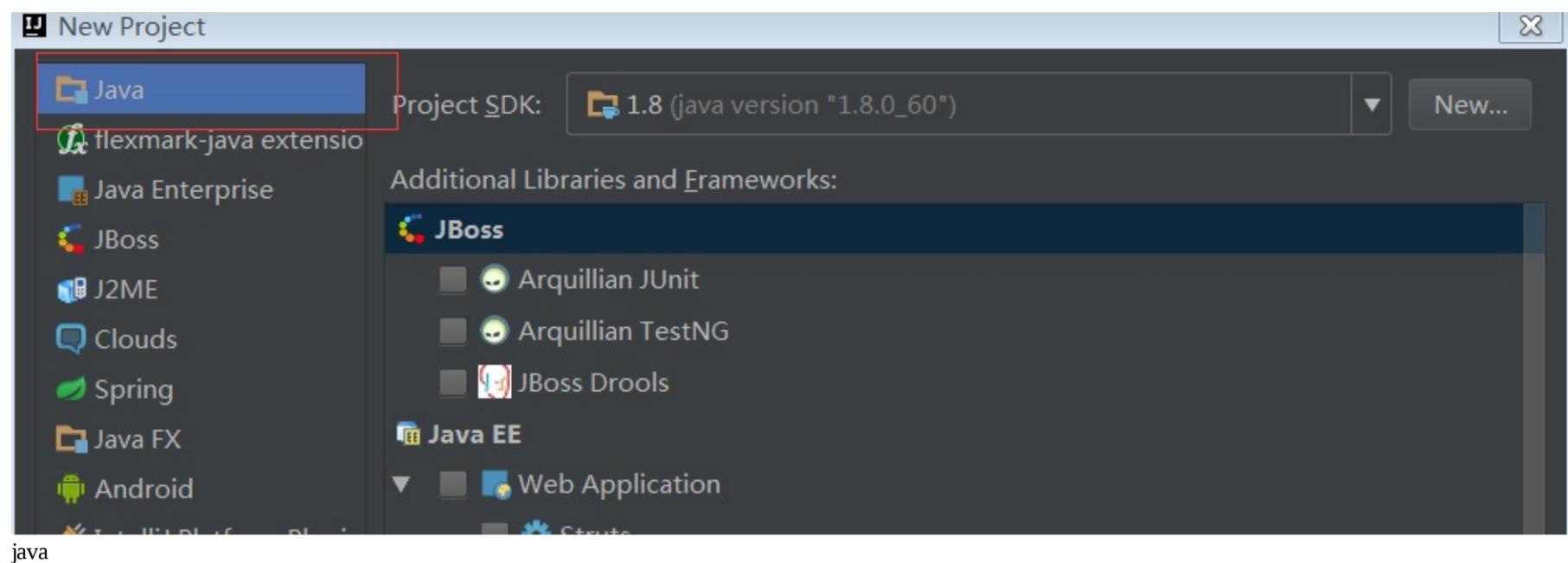
dbledble

- dbleAlert
- dbledble
- dbleAlert
- dble“”“”“”“”

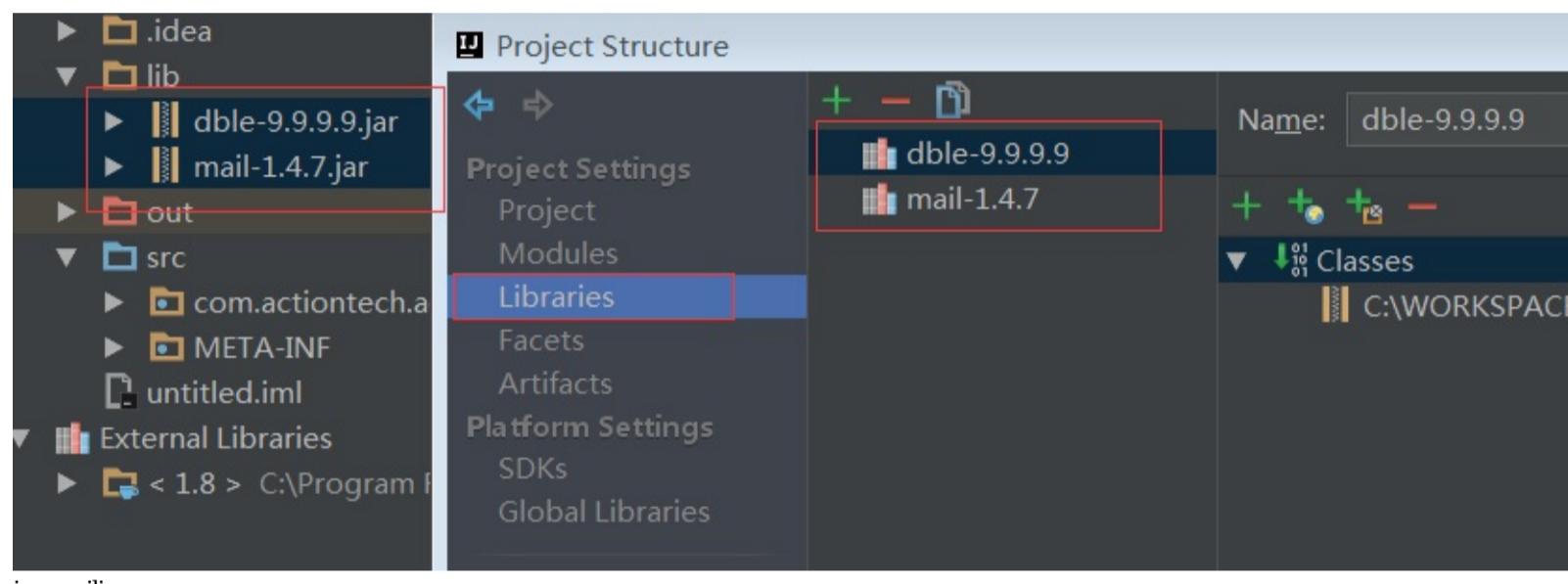
dble ----- Alert

IDEA

1 java



2 copylib



javamailjar

3.1 Alert

```
public MailAlert() {
    //init the mail data and read config file
    properties = AlertGeneralConfig.getInstance().getProperties();
}
```

AlertMailAlertGeneralConfig.getInstance().getProperties();dble(dble_alert.properties) dble_alert.propertiesAlertkey

3.2 Alert

```
@Override
public void alertConfigCheck() throws ConfigException {
    //check if the config is correct
    if (properties.getProperty(MAIL_SENDER) == null
        || properties.getProperty(SENDER_PASSWORD) == null
        || properties.getProperty(MAIL_SERVER) == null
        || properties.getProperty(MAIL_RECEIVE) == null) {
        throw new ConfigException("alert check error, for some config is missing");
    }
}
```

dble_alert.propertiesMAIL_SENDESENTER_PASSWORDMAIL_SERVERMAIL_RECEIVE dble

properties.getProperty(MAIL_RECEIVE)

3.3

send

```
private boolean sendMail(boolean isResolve, ClusterAlertBean clusterAlertBean) {
    try {
        Properties props = new Properties();
        props.setProperty("mail.debug", "true");
        props.setProperty("mail.smtp.auth", "true");
```

```

props.setProperty("mail.host", properties.getProperty(MAIL_SERVER));
props.setProperty("mail.transport.protocol", "smtp");

MailSSLSocketFactory sf = new MailSSLSocketFactory();
sf.setTrustAllHosts(true);
props.put("mail.smtp.ssl.enable", "true");
props.put("mail.smtp.ssl.socketFactory", sf);

Session session = Session.getInstance(props);

Message msg = new MimeMessage(session);
msg.setSubject("DBLE " + (isResolve ? "RESOLVE\n" : "ALERT\n"));
StringBuilder builder = new StringBuilder();
builder.append(groupMailMsg(clusterAlertBean, isResolve));
msg.setText(builder.toString());
msg.setFrom(new InternetAddress(properties.getProperty(MAIL_SENDER)));

Transport transport = session.getTransport();
transport.connect(properties.getProperty(MAIL_SERVER), properties.getProperty(MAIL_SENDER), properties.getProperty(SENDER_PASS
WORD));

transport.sendMessage(msg, new Address[]{new InternetAddress(properties.getProperty(MAIL_RECEIVE))});
transport.close();
//send EMAIL SUCCESS return TRUE
return true;
} catch (Exception e) {
    e.printStackTrace();
}
//send fail reutrn false
return false;
}

private String groupMailMsg(ClusterAlertBean clusterAlertBean, boolean isResolve) {
    StringBuffer sb = new StringBuffer("Alert mail:\n");
    sb.append("        Alert type:" + clusterAlertBean.getCode() + " " + (isResolve ? "RESOLVE\n" : "ALERT\n"));
    sb.append("        Alert message:" + clusterAlertBean.getDesc() + "\n");
    sb.append("        Alert component:" + clusterAlertBean.getAlertComponentType() + "\n");
    sb.append("        Alert componentID:" + clusterAlertBean.getAlertComponentId() + "\n");
    sb.append("        Alert source:" + clusterAlertBean.getAlertComponentId() + "\n");
    sb.append("        Alert server:" + clusterAlertBean.getServerId() + "\n");
    sb.append("        Alert time:" + TimeStamp2Date(clusterAlertBean.getTimestampUnix()) + "\n");
    String detail = "|";
    if (clusterAlertBean.getLabels() != null) {
        for (Map.Entry<String, String> entry : clusterAlertBean.getLabels().entrySet()) {
            detail += entry.getKey() + ":" + entry.getValue();
        }
    }
    sb.append("        Other detail:" + detail + "|\n");
    return sb.toString();
}

```

javaproPERTIES groupMailMsgclusterAlertBean

3.4

```

@Override
public void alertSelf(ClusterAlertBean clusterAlertBean) {
    alert(clusterAlertBean.setAlertComponentType(COMPARTMENT_TYPE).setAlertComponentId(properties.getProperty(COMPONENT_ID)));
}

@Override
public void alert(ClusterAlertBean clusterAlertBean) {
    clusterAlertBean.setSourceComponentType(COMPARTMENT_TYPE).
        setSourceComponentId(properties.getProperty(COMPONENT_ID)).
        setServerId(properties.getProperty(SERVER_ID)).
        setTimestampUnix(System.currentTimeMillis() * 1000000);
    sendMail(false, clusterAlertBean);
}

@Override
public boolean alertResolve(ClusterAlertBean clusterAlertBean) {
    clusterAlertBean.setSourceComponentType(COMPARTMENT_TYPE).
        setSourceComponentId(properties.getProperty(COMPONENT_ID)).
        setServerId(properties.getProperty(SERVER_ID)).
        setTimestampUnix(System.currentTimeMillis() * 1000000);
    return sendMail(true, clusterAlertBean);
}

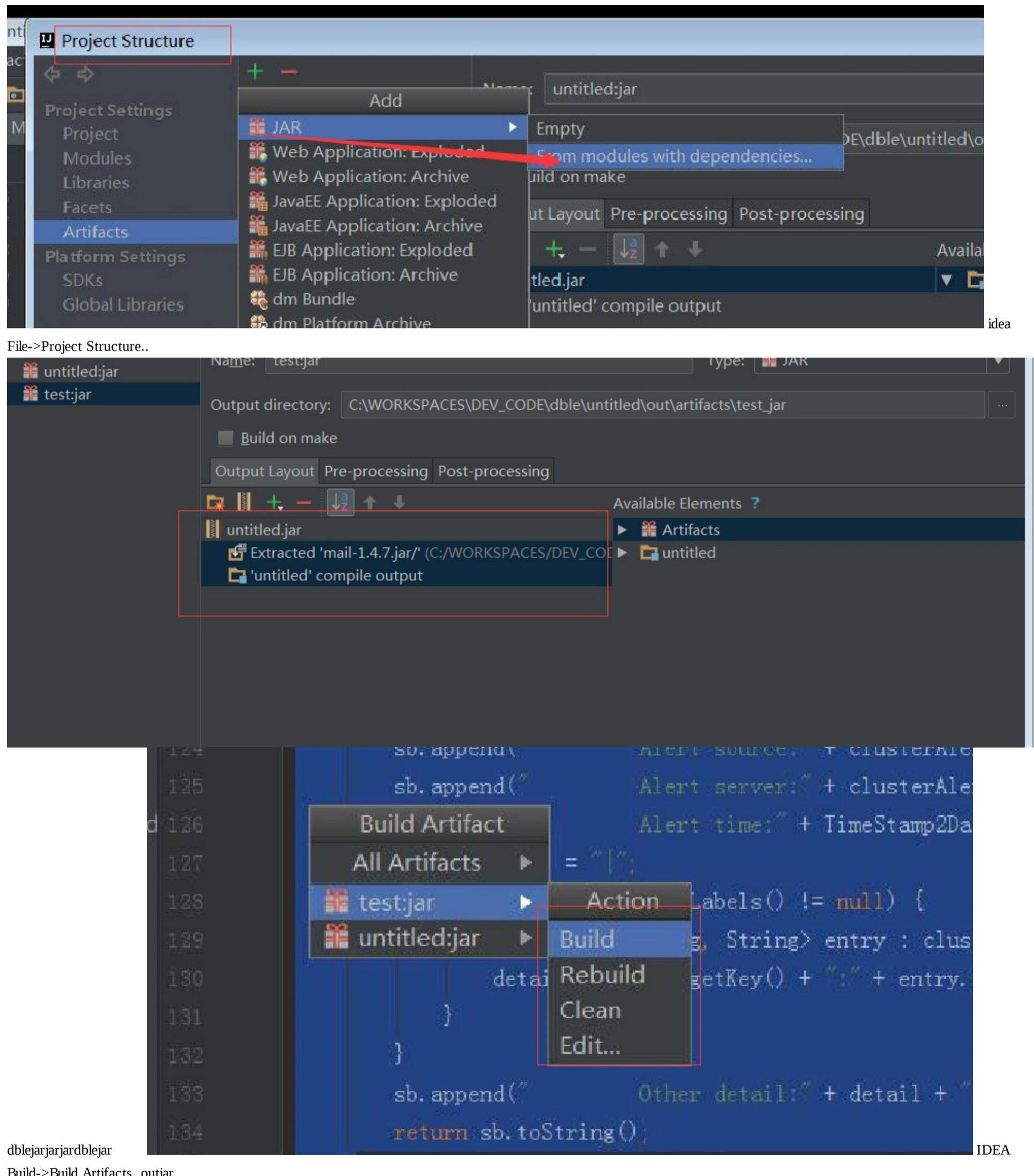
```

```

@Override
public boolean alertSelfResolve(ClusterAlertBean clusterAlertBean) {
    return alertResolve(clusterAlertBean.setAlertComponentType(COMPARTMENT_TYPE).setAlertComponentId(properties.getProperty(COMPONENT_ID)));
}

```

3.5 jar



1.11.2.2

jar

- jardblelib
- dble_alert.properties, alert
- dble lib dble_alert.properties,

```

alert=com.actiontech.addtionAlert.MailAlert
mail_sender=123456798@qq.com
sender_pass=qwertyuiop
mail_server=smtp.qq.com
mail_receive=yyyyyyyyyy@actionsky.com
server_id=dble-server-001
componnent_id=DBLE-FOR-XXX-01

```

dblecom.actiontech.addtionAlert.MailAlert

1.11.2.3

[jar](#)

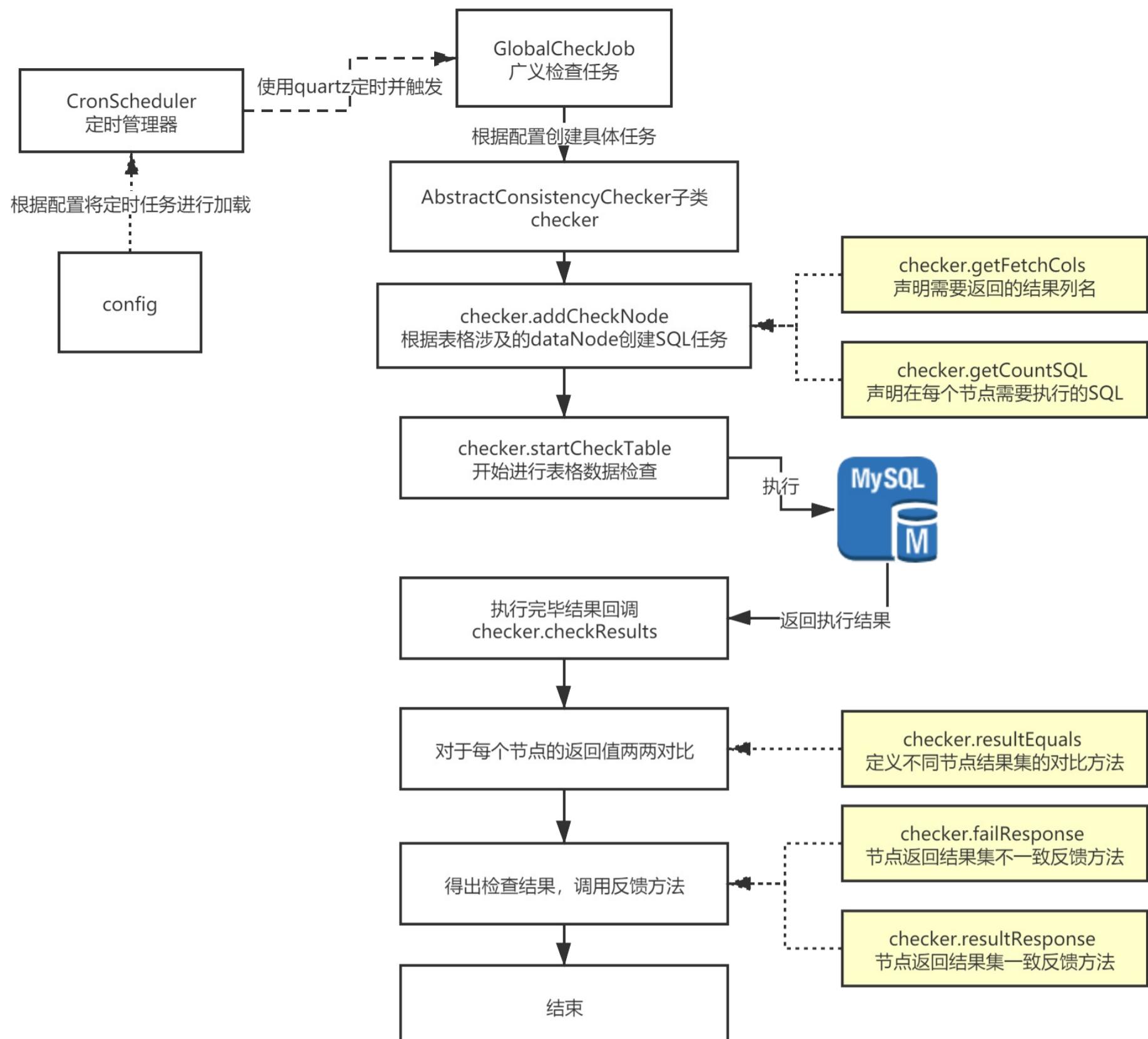
1.11.3 dbleCODE

DBLE_WRITE_TEMP_RESULT_FAIL		/
DBLE_XA_RECOVER_FAIL	XA	/
XA_READ_XA_STREAM_FAIL	XA	/
DBLE_XA_READ_DECODE_FAIL	XA	/
DBLE_XA_READ_IO_FAIL	XA	/
DBLE_XA_WRITE_IO_FAIL	XA	/
DBLE_XA_WRITE_CHECK_POINT_FAIL	XA	/
DBLE_XA_BACKGROUND_RETRY_FAIL	XA	/
DBLE_REACH_MAX_CON		/
DBLE_TABLE_NOT_CONSISTENT_IN_SHARDIN GS		/
DBLE_TABLE_NOT_CONSISTENT_IN_MEMORY	dble	/
DBLE_GLOBAL_TABLE_NOT_CONSISTENT		/
DBLE_CREATE_CONN_FAIL	mysql	/
DBLE_DB_INSTANCE_CAN_NOT_REACH		/
DBLE_KILL_BACKEND_CONN_FAIL	Kill	/
DBLE_NIOREACTOR_UNKNOWN_EXCEPTION	NIO	/
DBLE_NIOREACTOR_UNKNOWN_THROWABLE	NIO	/
DBLE_NIOCONNECTOR_UNKNOWN_EXCEPTION	NIO	/
DBLE_TABLE_LACK		/
DBLE_GET_TABLE_META_FAIL		/
DBLE_TEST_CONN_FAIL		/
DBLE_HEARTBEAT_FAIL		/
DBLE_SHARDING_NODE_LACK	shardingNode	/
DBLE_AP_NODE_LACK	apNode	/
DBLE_XA_SUSPECTED_RESIDUE	Xaid	/
DBLE_DB_SLAVE_INSTANCE_DELAY	delayThreshold	/
DBLE_XA_BACKGROUND_RETRY_STOP	XAxaRetryCount	/
SLOW_QUERY_QUEUE_POLICY_ABORT	slowQueueOverflowPolicy1	/
SLOW_QUERY_QUEUE_POLICY_WAIT	slowQueueOverflowPolicy2	/
DBLE_THREAD_SUSPECTED_HANG	TimerTimerSchedulerhang	/

-
- - [getCountSQL](#)
 - [getFetchCols](#)
 - [resultEquals](#)
 - [failResponse](#)
 - [resultResponse](#)
-
-

`dbletable_atable_a`

-
- - `dbletable_a`
 - `dbletable_a`



- reloadCronScheduler
- GlobalCheckJob
- GlobalCheckJobSQL
 - checkerSQL
 - shardingNodeSQL
- SQLSQLSQLMySQL
 - SQL()
 - SQLcheckResults
 - checkerSQL
 - SQL()failResponseSQL()resultResponse

1.SQLString getCountSQL(String dbName, String tName)

SQL
SQLMySQLdatabase
SQL

```
public String getCountSQL(String dbName, String tName) {
    //tablechecksum
    return "checksum table " + tName;
```

```
}
```

2. getFetchCols()

SQL

list

```
public String[] getFetchCols() {
    //checksumChecksum
    // mysql> checksum table suntest;
    //+-----+
    //| Table      | Checksum |
    //+-----+
    //| db1.suntest |1290812451|
    //+-----+
    //returnChecksum
    return new String[]{"Checksum"};
}
```

3.SQL boolean resultEquals(result1,result2)

resultresult1,result2

```
SQLQueryResult<List<Map<String, String>>> result
result
|
----- row(List)
|
-----Key-Value(Field-Value)
checksum
result
|
----- row(List<1> checksum table suntest)
|
-----Key-Value(checksum - 1290812451 getFetchCols)
```

list

```
public boolean resultEquals(SQLQueryResult<List<Map<String, String>>> or, SQLQueryResult<List<Map<String, String>>> cr) {
    //checksum
    //
    Map<String, String> oresult = or.getResult().get(0);
    Map<String, String> cresult = cr.getResult().get(0);
    //Mapchecksum
    return (oresult.get("Checksum") == null && cresult.get("Checksum") == null) ||
           (oresult.get("Checksum") != null && cresult.get("Checksum") != null &&
            oresult.get("Checksum").equals(cresult.get("Checksum")));
}
```

4. failResponse(resultList)

//

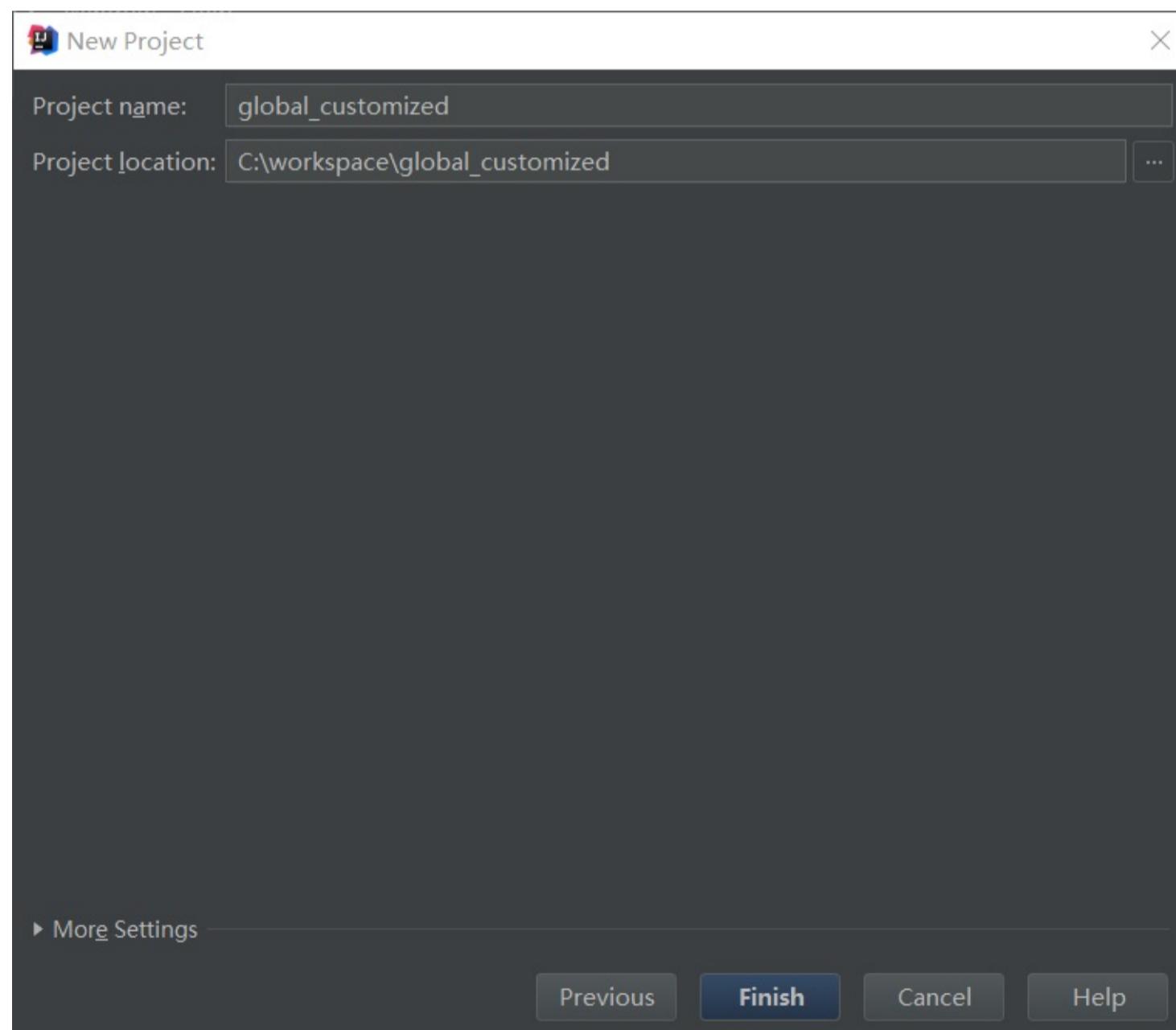
```
public void failResponse(List<SQLQueryResult<List<Map<String, String>>>> res) {
    //
    /////
    String errorMsg = "Global Consistency Check fail for table :" + schema + "-" + tableName;
    System.out.println(errorMsg);
    for (SQLQueryResult<List<Map<String, String>>> r : res) {
        System.out.println("Checksum is : " + r.getResult().get(0).get("Checksum"));
    }
}
```

5. void resultResponse(errorList)

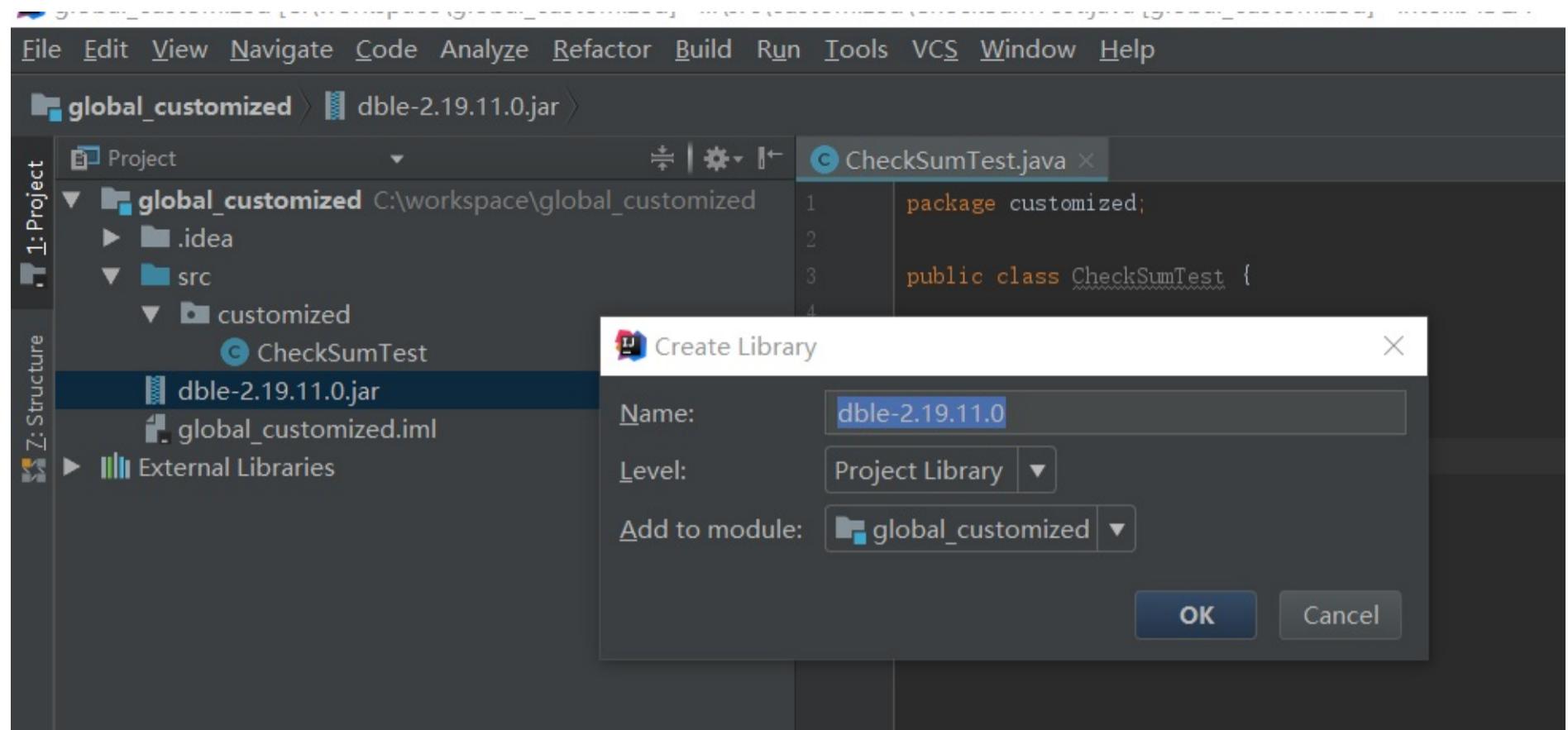
```
//  
0
```

```
public void resultResponse(List<SQLQueryResult<List<Map<String, String>>> elist) {  
    //SQLlistSQL  
    //SQLSQL  
    //  
    String tableId = schema + "." + tableName;  
  
    if (elist.size() == 0) {  
        System.out.println("Global Consistency Check success for table :" + schema + "-" + tableName);  
    } else {  
        System.out.println("Global Consistency Check fail for table :" + schema + "-" + tableName);  
        StringBuilder sb = new StringBuilder("Error when check Global Consistency, Table ");  
        sb.append(tableName).append(" shardingNode ");  
        for (SQLQueryResult<List<Map<String, String>>> r : elist) {  
            System.out.println("error node is : " + r.getTableName() + "-" + r.getShardingNode());  
            sb.append(r.getShardingNode()).append(",");  
        }  
        sb.setLength(sb.length() - 1);  
    }  
}
```

1 java



2 copylib



3.5

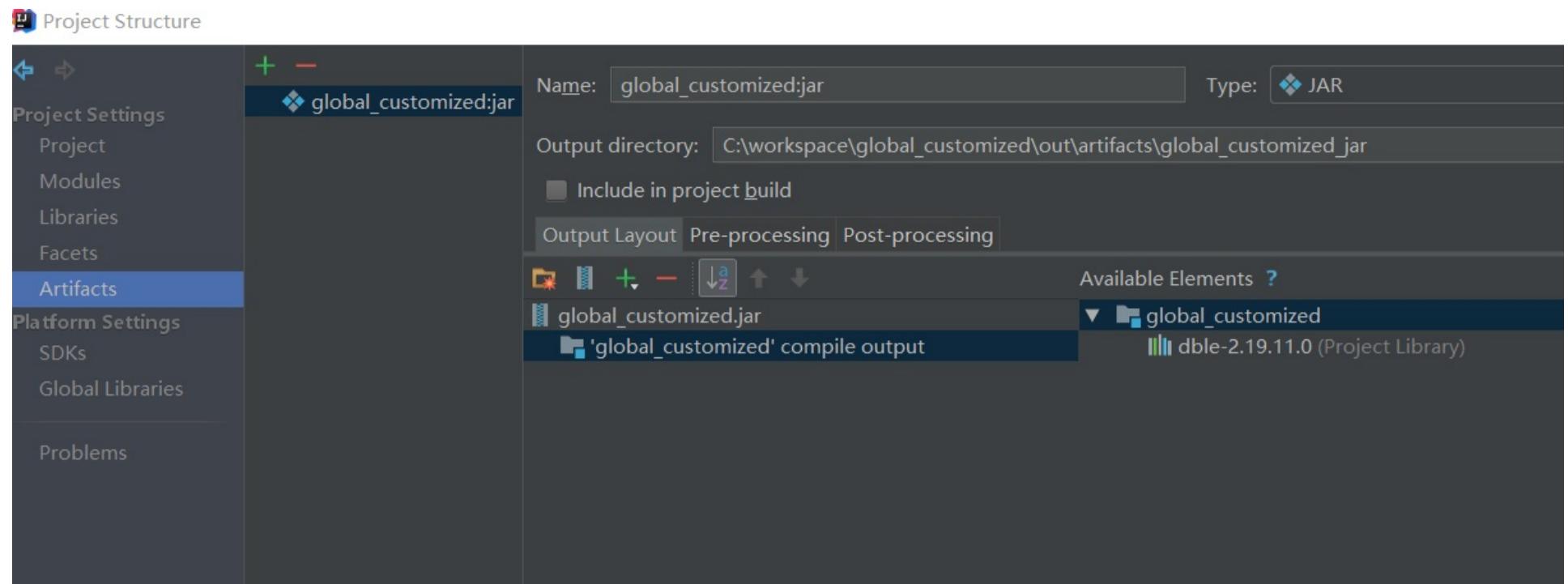
```

1 import com.actiontech.dble.backend.datasource.check.AbstractConsistencyChecker;
2 import com.actiontech.dble.sqlengine.SQLQueryResult;
3
4 import java.util.List;
5 import java.util.Map;
6
7 public class CustomizeTest extends AbstractConsistencyChecker {
8
9
10    @Override
11    public String[] getFetchCols() {
12        return new String[0];
13    }
14
15    @Override
16    public String getCountSQL(String s, String s1) {
17        return null;
18    }
19
20    @Override
21    public boolean resultEquals(SQLQueryResult<List<Map<String, String>>> sqlQueryResult, SQLQueryResult<List<Map<String, String>>> sqlQueryResult2) {
22        return false;
23    }
24
25    @Override
26    public void failResponse(List<SQLQueryResult<List<Map<String, String>>>> list) {
27    }
28
29    @Override
30    public void resultResponse(List<SQLQueryResult<List<Map<String, String>>>> list) {
31    }
32
33    }
34
35

```

按照自身的需要个实现这几个方法

4 jar

**5 jar**

schema.table

:reload

```
<!--dbleCHECKSUM-->
<globalTable name="tb_global1" shardingNode="dn1,dn2" cron = "0 * * * * ?" globalCheckClass="CHECKSUM"/>

<!--dbleCOUNT-->
<globalTable name="tb_global2" shardingNode="dn1,dn2" cron = "0 * * * * ?" globalCheckClass="COUNT"/>

<!--CustomizeTest-->
<globalTable name="tb_global3" shardingNode="dn1,dn2" cron = "0 * * * * ?" globalCheckClass="CustomizeTest"/>
```

jardblejaralgorithmlibdblejavajardble

jardblereload

1.13 Schema

1.13.1

3000+ pocschemas schema

1.13.2

```
<!-- schema default multi shardingNode[dn1,dn2] and split algorithm[func_common_hash];
In multi shardingNode, loaded tables are called 'default sharding tables'; In fact, equivalent to shardingTable;
But, it is not recommended to configure the Sharding table in the production environment -->
<schema name="testdb3" shardingNode="dn1,dn2" function="func_common_hash"/>
```

1.13.3

1.13.3.1

```
<schema name="TESTDB0" shardingNode="dn9,dn10" function="func_common_hash" sqlMaxLimit="100">
    <shardingTable name="tableA" shardingNode="dn1,dn2" function="func_common_hash" shardingColumn="c1"/>
</schema>
```

1.13.3.2

```
CREATE TABLE `tableA` (
    `c1` int(11) ,
    `c2` varchar(200) DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

CREATE TABLE `tableB` (
    `c1` int(11) auto_increment,
    `c2` varchar(200) DEFAULT NULL,
    `c3` int(11) ,
    `c4` int(11) ,
    `c5` int(11) ,
    `c6` int(11) ,
    INDEX indexs (c5,c6),
    unique KEY (`c4`),
    KEY `index1` (`c3`),
    primary KEY (`c1`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

1.13.3.3

- **Dble**
- **shardingNode** functions shardingTable shardingNode function
- schemaDble
 - - DDL create table DDL
 - (/reload) show creatata table
 - (auto_increment)->->->id->; (function); tableB'c4'
 - DDL(reload @@metadata)()
- **View** schema schemaDble View
- **DML&DDL** shardingTable
- (reload)(bootstrap.cnf -DcheckTableConsistency=1)
 - shardingNodeDble
 - shardingNodeDble: has been lost, will remove his metadata
- **reload**
 - reload @@metadata [where schema=? [and table=?]]
 - reload @@config_all [-s] [-f] [-r] ()
- - dble_schema function
 - dble_table dble_table_sharding_nodedble_sharding_tableid'FC'schema('FC' ididDbreloadid)

```
mysql> select * from dble_schema;
+-----+-----+-----+
| name | sharding_node | function | sql_max_limit |
+-----+-----+-----+
```

```
+-----+-----+-----+
| TESTDB0 | dn9,dn10      | func_common_hash |      100 |
+-----+-----+-----+
1 row in set (0.00 sec)

mysql> select * from dble_table;
+-----+-----+-----+-----+
| id   | name    | schema  | max_limit | type      |
+-----+-----+-----+-----+
| C1   | tableA | TESTDB0 |      100 | SHARDING |
| FC2  | tableB | TESTDB0 |      100 | SHARDING |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> select * from dble_table_sharding_node;
+-----+-----+-----+
| id   | sharding_node | order |
+-----+-----+-----+
| C1   | dn1          | 0     |
| C1   | dn2          | 1     |
| FC2  | dn9          | 0     |
| FC2  | dn10         | 1     |
+-----+-----+-----+
4 rows in set (0.01 sec)

mysql> select * from dble_sharding_table;
+-----+-----+-----+-----+
| id   | increment_column | sharding_column | sql_required_sharding | algorithm_name |
+-----+-----+-----+-----+
| C1   | NULL           | C1             | false                 | func_common_hash |
| FC2  | NULL           | C4             | false                 | func_common_hash |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

2.

- 2.0
- 2.1
 - 2.1.1 select
 - 2.1.2 set
 - 2.1.3 show
 - 2.1.4 switch
 - 2.1.5 kill
 - 2.1.6 stop
 - 2.1.7 reload
 - 2.1.8 rollback
 - 2.1.9 offline
 - 2.1.10 online
 - 2.1.11 file
 - 2.1.12 log
 - 2.1.13
 - 2.1.14 pause & resume
 - 2.1.15
 - 2.1.16 /
 - 2.1.17 check @@metadata
 - 2.1.18 release @@reload_metadata
 - 2.1.19 split
 - 2.1.20 flow_control
 - 2.1.21
 - 2.1.22
- 2.2
 - 2.2.1 MySQL offset-step
 - 2.2.2
 - 2.2.3
 - 2.2.4 offset-step
- 2.3
- 2.4
- 2.5
 - 2.5.1 XA
 - 2.5.2 XA
 - 2.5.3 XA
 - 2.5.4 XA
 - 2.5.5
 - 2.5.6 XA
- 2.6
- 2.7
- 2.8 &
- 2.9 grpc
- 2.10 meta
 - 2.10.1 Meta
 - 2.10.2 Meta
 - 2.10.3
 - 2.10.4 View Meta
- 2.11
 - 2.11.1
 - 2.11.2
 - 2.11.3
 - 2.11.4
 - 2.11.5 heartbeat
 - 2.11.6
 - 2.11.7 sql
- 2.12
- 2.13
- 2.14 ER
- 2.15 global
- 2.16
- 2.17
- 2.18
- 2.19 reload
- 2.20

-
- [2.21 SQLtrace](#)
 - [2.22 KILL @@DDL_LOCK](#)
 - [2.23](#)
 - [2.24](#)
 - [2.25](#)
 - [2.26 client_found_rows](#)
 - [2.27 general](#)
 - [2.28 sql](#)
 - [2.29 load data](#)
 - [2.30 injoin](#)
 - [2.31 DDL](#)
 - [2.32](#)
 - [2.33 hint](#)
 - [2.34](#)
 - [2.35](#)
 - [2.36](#)
 - [2.37](#)
 - [2.38 tcp](#)
 - [2.39 HTAP](#)
 - [2.40 dble\(printkillrecover\)](#)

2.0 dble_information

2.0.0

```
dble_information dbledbleuse dble_information
:
(select)
(where)
(join)
where
```

```
use dble_information
show tables [ like ]
desc|describe table xxx
show databases; show @@database
INSERT/UPDATE/DELETE
```

2.0.1 dble_information

2.0.1.0 version

- version
- dble
-

version	true	

- - dble

2.0.1.1 dble_variables

- dble_variables
-
-

variable_name	true	
variable_value		
comment		
read_only		

- - version_comment
 - isOnline:
 - heap_memory_max (mb)
 - direct_memory_max: -XX:MaxDirectMemorySize
- show @@sysparam

2.0.1.2 dble_status

- dble_status
-
-

variable_name	true	
variable_value		
comment		

-

```

- uptime: dble()
- current_timestamp: dble
- startup_timestamp: dble
- heap_memory_max:
- heap_memory_used:
- heap_memory_total:
- config_reload_timestamp: config
- direct_memory_max: -XX:MaxDirectMemorySize
- direct_memory_pool_size: bufferpoolpagesizebufferpoolpagenumber
- direct_memory_pool_used: directmemory
- questions:
- transactions:

```

2.0.1.3 thread pool

2.0.1.3.1 dble_thread_pool

- dble_thread_pool
-
-

name	true	
pool_size		
core_pool_size		
active_count		
waiting_task_count		(,)

-
- active_count/waiting_task_count dble frontWorkerwriteToBackendWorker """ """ dble_thread_pool_task

2.0.1.3.2 dble_thread_pool_task

- dble_thread_pool_task
-
-

name	true	
pool_size		
active_task_count		
task_queue_size		(,)
completed_task		
total_task		

-

2.0.1.4 dble_processor

- dble_processor
- processor
-

name	true	
type		(session/backend)
conn_count		
conn_net_in		(0)
conn_net_out		(0)

-

2.0.1.5 dble_sharding_node

- dble_sharding_node
- sharding_node
-

name	true	
db_group		db_group
db_schema		db_schema
pause		

-

2.0.1.6 dble_db_group

- dble_db_group
- db_group
-

name	true	
heartbeat_stmt		sql
heartbeat_timeout		()
heartbeat_retry		
rw_split_mode		
delay_threshold		
disable_ha		
active		

-

2.0.1.7 dble_db_instance

- dble_db_instance
- db_instance
-

name	true	
db_group	true	db_group
addr		
port		
primary		
user		
password_encrypt		
encrypt_configured		
active_conn_count		
idle_conn_count		
read_conn_request		
write_conn_request		
disabled		disabled
last_heartbeat_ack_timestamp		
last_heartbeat_ack		init/ok/error/timeout
heartbeat_status		idle/checking
heartbeat_failure_in_last_5min		5,
min_conn_count		
max_conn_count		

read_weight		
db_district		mysql
db_data_center		mysql
id		id
connection_timeout		
connection_heartbeat_timeout		
test_on_create		
test_on_borrow		
test_on_return		
test_while_idle		
time_between_eviction_runs_millis		
evictor_shutdown_timeout_millis		
idle_timeout		
heartbeat_period_millis		
flow_high_level		
flow_low_level		

•

2.0.1.8 dble_schema

- dble_schema
- schema
-

name	true	
sharding_node		dble_sharding_node
ap_node		dble_ap_node
function		
sql_max_limit		
logical_create_and_drop		trueschema

•

2.0.1.9 session_variables

- session_variables
-
-

session_conn_id	true	id
variable_name	true	
variable_value		
variable_type		(sys/user)

•

```

- tx_read_only(mysql8.0)
- transaction_read_only(mysql5.7)
- character_set_client
- collation_connection
- character_set_results
- tx_isolation_level(mysql8.0)
- transaction_isolation (mysql5.7)
- autocommit
-
```

2.0.1.10 session_connections

- session_connections

-

-

session_conn_id	true	id
remote_addr		
remote_port		
local_port		
processor_id		id
user		
tenant		
schema		schema? (/)
sql		sql(10241024)
sql_execute_time		sql, sql(ms)20ms
sql_start_timestamp		sql
sql_stage		,finished
conn_net_in		
conn_net_out		
conn_estab_time		0
conn_recv_buffer		0 (, ,)
conn_send_task_queue		0 (,)
conn_recv_task_queue		0 (,)
in_transaction		
xa_id		xid, XA
entry_id		id

-

2.0.1.11 backend_variables

- backend_variables
-
-

backend_conn_id	true	id
variable_name	true	
variable_value		
variable_type		(sys/user)

-

```

- tx_read_only, (mysql8.0)
- transaction_read_only, (mysql5.7)
- character_set_client,
- collation_connection,
- character_set_results,
- tx_isolation_level, (mysql8.0)
- transaction_isolation, (mysql5.7)
- autocommit,
-
```

2.0.1.12 backend_connections

- backend_connections
-
-

backend_conn_id	true	id
db_group_name		db
db_instance_name		db
remote_addr		
remote_port		
remote_processlist_id		mysqlid
local_port		
processor_id		id
user		
schema		schema? (/)
session_conn_id		id,
sql		sql(10241024)
sql_execute_time		sql20ms
mark_as_expired_timestamp		, ,
conn_net_in		
conn_net_out		
conn_estab_time		(0
borrowed_from_pool		0)
state		
conn_recv_buffer		(0 (, ,)
conn_send_task_queue		(0 (,)
used_for_heartbeat		
conn_closing		
xa_status		xa
in_transaction		

•

2.0.1.13 dble_table

2.0.1.13.0 dble_table

- dble_table
- table
-

id	true	tableC\$chemamysqltableMschemamysqltableFC
name		
schema		schema
max_limit		
type		global/single/sharding/child/no sharding

•

nameschema

•

2.0.1.13.1 dble_global_table

- dble_global_table
-
-

id	true	dble_tableid
check		
checkClass		class
cron		

-

2.0.1.13.2 dble_sharding_table

- dble_sharding_table
-
-

id	true	dble_tableid
increment_column		
sharding_column		
sql_required_sharding		sqlRequiredSharding
algorithm_name		

-

2.0.1.13.3 dble_child_table

- dble_child_table
-
-

id	true	dble_tableid
parent_id		id
increment_column		
join_column		
paren_column		

-

2.0.1.13.4 dble_table_sharding_node

- dble_table_sharding_node
- sharding_node
-

id	true	dble_tableid
sharding_node	true	
order		sharding_node(0)

-

2.0.1.14 dble_algorithm

- dble_algorithm
-
-

name	true	
key	true	
value		
is_file		mapfiletruefilefalsecontentmapfile1024

-

2.0.1.15 dble_entry

2.0.1.15.0 dble_entry

- dble_entry

- (+)

-

id	true	
type		(username/conn_attr),
user_type		//sharding
username		
password_encrypt		
encrypt_configured		
conn_attr_key		tenant
conn_attr_value		
white_ips		
readonly		-
max_conn_count		
blacklist		

-

2.0.1.15.1 dble_entry_schema

- dble_entry_schema

- schema

-

id	true	dble_entryid
schema	true	schema

-

2.0.1.15.2 dble_rw_split_entry

- dble_rw_split_entry

- schema

-

id	true	
type		(username/conn_attr),
username		
password_encrypt		
encrypt_configured		
conn_attr_key		tenant
conn_attr_value		
white_ips		
max_conn_count		
blacklist		
db_group		db_group

-

username conn_attr_key conn_attr_value

-

2.0.1.15.3 dble_entry_table_privilege

- dble_entry_table_privilege

- privilege

-

--	--	--

id	true	dble_entryid
schema	true	schema
table	true	table
exist_metas		tabledb
insert		insert
update		update
select		select
delete		delete
is_effective		

•

2.0.1.16 dble_blacklist

- dble_blacklist
-
-

name	true	
property_key	true	key
property_value		value
user_configured		

•

2.0.1.17 processlist

- processlist
- (NULL)
-

front_id	true	id
db_instance		name
mysql_id	true	mysql id
user		
front_host		
mysql_db		mysql 'show processlist' db
command		mysql mysql 'show processlist' command
time		mysqlstate mysql 'show processlist' time
state		mysql mysql 'show processlist' state
info		mysql mysql 'show processlist' info

- (show @@processlist)

2.0.1.18 dble_thread_usage

- dble_thread_usage
-
-

thread_name	true	
last_quarter_min		15s
last_minute		1min
last_five_minute		5min

- (show @@thread_used;)

2.0.1.19 dble_reload_status

- dble_reload_status
- reload
-

index	true	reload[RL]
cluster		dble
reload_type		reload reload_matadata/reload_all/manager_insert/manager_update/mamager_delete
reload_status		reload not_reloading/self_reload/meta_reload/waiting_others
last_reload_start		
last_reload_end		
trigger_type		local_command/cluster_notify
end_type		

- (show @@reload_status)

2.0.1.20 dble_xa_session

- dble_xa_session
- xa
-

front_id	true	id
xa_id		xaid
xa_state		xa
sharding_node	true	xasharding_node,

- (show @@session.xa)

2.0.1.21 dble_ddl_lock

- dble_ddl_lock
- dbleddl
-

schema	true	schema
table	true	table
sql		ddl sql

- (show @@ddl)

2.0.1.22 sql_statistic_by_frontend_by_backend_by_entry_by_user

- sql_statistic_by_frontend_by_backend_by_entry_by_user
- sql
-

entry	true	dble_entryid
user	true	
frontend_host	true	ip
backend_host	true	ip
backend_port	true	
sharding_node	true	
tx_count	false	

tx_rows	false	
tx_time	false	
sql_insert_count	false	insert
sql_insert_rows	false	insert
sql_insert_time	false	insert
sql_update_count	false	update
sql_update_rows	false	update
sql_update_time	false	update
sql_delete_count	false	delete
sql_delete_rows	false	delete
sql_delete_time	false	delete
sql_select_count	false	select
sql_select_rows	false	dble
sql_select_time	false	select
last_update_time	false	

-

```
mysql> select * from sql_statistic_by_frontend_by_backend_by_entry_by_user;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| entry | user | frontend_host | backend_host | backend_port | sharding_node | db_instance | tx_count | tx_rows | tx_time | sql_insert_count | sql_insert_rows | sql_insert_time | sql_update_count | sql_update_rows | sql_update_time | sql_delete_count | sql_delete_rows | sql_delete_time | sql_select_count | sql_select_rows | sql_select_time | last_update_time |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 3 | test | 127.0.0.1 | 10.186.63.8 | 24801 | dn1 | instanceM1 | 1 | 1 | 1 | 15293 | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 1 | 15293 | 2021-07-09 11:18:10.525 |
| 3 | test | 127.0.0.1 | 10.186.63.7 | 24801 | dn2 | instanceM2 | 1 | 1 | 3 | 13819 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 3 | 13819 | 2021-07-09 11:18:10.525 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

2.0.1.23 sql_statistic_by_table_by_user_by_entry

- sql_statistic_by_table_by_user_by_entry
- sql
-

entry	true	dble_entryid
user	true	
table	true	
sql_insert_count	false	insert
sql_insert_rows	false	insert
sql_insert_time	false	insert
sql_update_count	false	update
sql_update_rows	false	update
sql_update_time	false	update
sql_delete_count	false	delete
sql_delete_rows	false	delete
sql_delete_time	false	delete
sql_select_count	false	select
sql_select_examined_rows	false	dble
sql_select_rows	false	

sql_select_time	false	select
last_update_time	false	

-

```
mysql> select * from sql_statistic_by_table_by_user_by_entry;
+-----+-----+-----+-----+-----+-----+-----+-----+
| entry | user | table          | sql_insert_count | sql_insert_rows | sql_insert_time | sql_update_count | sql_update_rows | sql_
_update_time | sql_delete_count | sql_delete_rows | sql_delete_time | sql_select_count | sql_select_rows | sql_select_examined_rows |
|       |       |                 |                |                |                |                |                |                |                |                |                |                |                |                |
| 3 | test | testdb.tb_jump_hash | 0 | 0 | 0 | 1 | 4 | 0 | 4 |
|     |     | 290440 | 2021-07-09 11:18:10.536 |
| 3 | test | null           | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
|     |     | 2131 | 2021-07-09 11:09:30.755 |
+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.01 sec)
```

2.0.1.24 sql_statistic_by_associate_tables_by_entry_by_user

- sql_statistic_by_associate_tables_by_entry_by_user
- sql
-

entry	true	dble_entryid
user	true	
tables	true	
sql_select_count	false	select
sql_select_examined_rows	false	dble
sql_select_rows	false	
sql_select_time	false	select
last_update_time	false	

-

```
mysql> select * from sql_statistic_by_associate_tables_by_entry_by_user;
+-----+-----+-----+-----+-----+-----+-----+
| entry | user | associate_tables          | sql_select_count | sql_select_rows | sql_select_examined_rows | sql_select_time | last_update_time |
|       |       |                 |                |                |                |                |                |
| 3 | test | testdb.tabler,testdb.tb_jump_hash | 1 | 168 | 46 | 92004 |
|     |     | 2021-07-09 11:20:16.392 |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

2.0.1.25 sql_log

- sql_log
- sql
-

sql_id	true	sql id
sql_stmt	false	SQL(1024)
sql_digest	false	SQLdigest(1024)
sql_type	false	SQL

tx_id	true	ibbleID
entry	false	dble_entryid
user	false	
source_host	false	IP
source_port	false	port
rows	false	
examined_rows	false	
result_size	false	
start_time	false	
duration	false	

-

```
mysql> select * from sql_log;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| sql_id | sql_stmt          | sql_digest           | sql_type | tx_id | entry | user | source_host | source_port |
| rows | examined_rows | start_time | duration |       |       |       |       |       |       |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|   1 | show databases      | show databases      | Show    |   1 |   3 | test | 127.0.0.1 |      |
| 8066 |      7 | 0 | 2021-07-09 11:09:30 | 7919460 |      |
|   2 | show tables         | show tables         | Show    |   2 |   3 | test | 127.0.0.1 |      |
| 8066 |      32 | 0 | 2021-07-09 11:09:30 | 14972767 |      |
|   3 | select @@version_comment limit 1 | SELECT @@version_comment LIMIT ? | Select |   3 |   3 | test | 127.0.0.1 |      |
| 8066 |      1 | 0 | 2021-07-09 11:09:30 | 2131628 |      |
|   4 | show tables         | show tables         | Show    |   4 |   3 | test | 127.0.0.1 |      |
| 8066 |      32 | 0 | 2021-07-09 11:09:34 | 1428683 |      |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.04 sec)
```

2.0.1.26 sql_log_by_tx_by_entry_by_user

- sql_log_by_tx_by_entry_by_user
- sql log
-

tx_id	false	ibbleID
entry	false	dble_entryid
user	false	
source_host	false	IP
source_port	false	port
sql_ids	false	sql_id(1024)
sql_exec	false	SQL
tx_duration	false	
busy_time	false	SQL
examined_rows	false	

-

```
mysql> select * from sql_log_by_tx_by_entry_by_user;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| tx_id | entry | user | source_host | source_port | sql_ids | sql_exec | tx_duration | busy_time | examined_rows |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|   1 |   3 | test | 127.0.0.1 |      | 8066 | 1 |      | 1 | 7919460 | 7919460 |      | 0 |
|   2 |   3 | test | 127.0.0.1 |      | 8066 | 2 |      | 1 | 14972767 | 14972767 |      | 0 |
|   3 |   3 | test | 127.0.0.1 |      | 8066 | 3 |      | 1 | 2131628 | 2131628 |      | 0 |
|   4 |   3 | test | 127.0.0.1 |      | 8066 | 4 |      | 1 | 1428683 | 1428683 |      | 0 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.05 sec)
```

2.0.1.27 sql_log_by_digest_by_entry_by_user

- sql_log_by_digest_by_entry_by_user

- sql log

-

sql_digest	false	sqldigest
entry	false	dble_entryid
user	false	
exec	false	sql digestsq
duration	false	sql
rows	false	
examined_rows	false	
avg_duration	false	sql

-

```
mysql> select * from sql_log_by_digest_by_entry_by_user;
+-----+-----+-----+-----+-----+-----+
| sql_digest | entry | user | exec | duration | rows | examined_rows | avg_duration |
+-----+-----+-----+-----+-----+-----+
| SELECT @@version_comment LIMIT ? | 3 | test | 1 | 2131628 | 1 | 0 | 2131628.0000 |
| show databases | 3 | test | 1 | 7919460 | 7 | 0 | 7919460.0000 |
| show tables | 3 | test | 2 | 16401450 | 64 | 0 | 714341.5000 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.02 sec)
```

2.0.1.28 sql_log_by_tx_digest_by_entry_by_user

- sql_log_by_tx_digest_by_entry_by_user

- sql log

-

tx_digest	false	sql_digest
exec	false	tx_digest
entry	false	dble_entryid
user	false	
sql_exec	false	SQL
source_host	false	IP
source_port	false	port
sql_ids	false	sql_id(1024)
tx_duration	false	
busy_time	false	SQL
examined_rows	false	

-

```
mysql> select * from sql_log_by_tx_digest_by_entry_by_user;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| tx_digest | exec | user | entry | sql_exec | source_host | source_port | sql_ids | tx_duration | busy_time |
| examined_rows |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| SELECT @@version_comment LIMIT ? | 1 | test | 3 | 1 | 127.0.0.1 | 8066 | 3 | 2131628 | 2131628 |
| 0 |
| show databases | 1 | test | 3 | 1 | 127.0.0.1 | 8066 | 1 | 7919460 | 7919460 |
| 0 |
| show tables | 2 | test | 3 | 2 | 127.0.0.1 | 8066 | 2,4 | 16401450 | 16401450 |
| 0 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.03 sec)
```

2.0.1.29 dble_config

- dble_config

- dbledbshardingusersequence

•

content	false	dbshardingusersequencejson

-
- [dble_config](#)

2.0.1.30 dble_xa_recover

- dble_xa_recover
- XA
-

dbggroup	false	
instance	false	
ip	false	ip
port	false	
formatid	false	mysqlxa_recoverformatid
gtrid_length	false	mysqlxa_recovergtrid_length
bqual_length	false	mysqlxa_recoverbqual_length
data	false	mysqlxa_recoverdata

•

2.0.1.31 dble_flow_control

- dble_flow_control
-
-

connection_type	true	MySQLConnection/ServerConnection
connection_id	true	dbleIDID
connection_info	false	IPMySQLID
writing_queue_bytes	false	
reading_queue_bytes	false	null
flow_controlled	false	

•

2.0.1.32 session_connections_active_ratio

- session_connections_active_ratio
- 30s/1min/5min
30s 15000ms(15000ms/30000ms)*100%=50%
-

session_conn_id	true	id
last_half_minute	false	30s
last_minute	false	1min
last_five_minute	false	5min

•

2.0.1.33 session_connections_associate_thread

- session_connections_associate_thread
-

-

session_conn_id	true	id
thread_name	true	

-

2.0.1.34 backend_connections_associate_thread

- backend_connections_associate_thread
-
-

backend_conn_id	true	id
thread_name	true	

-

2.0.1.35 dble_cluster_renew_thread

- dble_cluster_renew_thread
- renew
-

renew_thread	true	renew

-

2.0.1.32 recycling_resource

- recycling_resource
-
-

type	false	dbGroup/dbInstance/backendConnection
info	false	

-

2.0.1.33 dble_memory_resident

- dble_memory_resident
- enableMemoryBufferMonitor
-

id	true	id buffer
stacktrace	false	buffer
buffer_type	false	buffer NORMAL/HEARTBEAT/POOL
allocate_size	false	buffer bufferPoolChunkSize
allocate_time	false	buffer
alive_second	false	buffer
sql	false	buffer sql<<FRONT>><<BACK>>

-

2.0.1.34 dble_ap_node

- dble_ap_node
- ap_node

-

name	true	
db_group		db_group
db_schema		db_schema

-

2.0.2 INSERT/UPDATE/DELETE&

2.0.2.0 INSERT Syntax

```
INSERT
  [INTO] tbl_name
  [(col_name [, col_name] ...)]
  {VALUES | VALUE} (value_list) [, (value_list)] ...
  ...

INSERT
  [INTO] tbl_name
  SET assignment_list
```

- INSERT ...SELECT ,LOW_PRIORITY,DELAYED,HIGH_PRIORITY,IGNORE,ON DUPLICATE KEY UPDATE,PARTITION

2.0.2.1 UPDATE Syntax

```
UPDATE table_reference
  SET assignment_list
  WHERE where_condition
value:
  {expr | DEFAULT}
assignment:
  col_name = value
assignment_list:
  assignment [, assignment]
```

-
-
-
- LOW_PRIORITY IGNORE ORDER BY LIMIT ,PARTITION
- where
-

2.0.2.2 DELETE Syntax

```
DELETE FROM tbl_name WHERE where_condition
```

-
-
- LOW_PRIORITY IGNORE ORDER BY LIMIT ,PARTITION
- where
-

2.0.2.3 TRUNCATE Syntax

```
TRUNCATE [TABLE] tbl_name
```

-

2.0.2.4 INSERT/UPDATE/DELETE

2.0.2.4.0 dble_db_group

- active

2.0.2.4.1 dble_db_instance

- active_conn_countidle_conn_countread_conn_requestwrite_conn_requestlast_heartbeat_ack_timestamplast_heartbeat_ackheartbeat_statusheartbeat_failure_in_last_5min

dble_db_groupdble_db_instancedb.xmlMysqldble_db_groupdble_db_instance

2.0.2.4.2 dble_rw_split_entry

- idblacklisttype

2.0.2.4.3 dble_thread_pool

- UPDATEINSERT/DELETE
- core_pool_size

1JDKThreadPoolExecutorcore_pool_size

2AIONIOFrontRW NIOBackendRWNIONIOFrontRW NIOBackendRW

3

2.0.2.5 TRUNCATE

sql_statistic_by_frontend_by_backend_by_entry_by_usersql_statistic_by_table_by_user_by_entriesql_statistic_by_associate_tables_by_entry_by_user sql_log

2.0.1.27 dble_config

dbledbshardingusersequence

```
select * from dble_config\G
Json      Json

***** 1. row *****
content: {"version":"4.0","dbGroup": [{"rwSplitMode":0,"name":"ha_group1","delayThreshold":100,"disableHA":"true","heartbeat": {"value": "select user()"}, "dbInstance": [{"name": "hostM1","url": "***","password": "123456","user": "root","maxCon": 200,"minCon": 10,"usingDecrypt": "false","disabled": "false","id": "hostM1Id","readWeight": "10","primary": true}, {"name": "hostM5","url": "***","password": "123456","user": "root","maxCon": 15,"minCon": 15,"disabled": "false","primary": false}], {"rwSplitMode":0,"name": "ha_group2","heartbeat": {"value": "select user()"}, "dbInstance": [{"name": "hostM2","url": "***","password": "123456","user": "root","maxCon": 200,"minCon": 10,"primary": true}], {"rwSplitMode":0,"name": "ha_group3","delayThreshold": -1,"heartbeat": {"value": "select user()"}, "dbInstance": [{"name": "hostM3","url": "***","password": "123456","user": "root","maxCon": 15,"minCon": 15,"disabled": "false","primary": true}], {"schema": [{"name": "testdb","sqlMaxLimit": 100,"shardingNode": "dn1","table": [{"type": "ShardingTable","properties": {"function": "func_enum","shardingColumn": "code","name": "tb_enum_sharding","shardingNode": "dn1,dn2","sqlMaxLimit": 200}}, {"type": "GlobalTable","properties": {"name": "test1","shardingNode": "dn1,dn2,dn3,dn4"}]}], {"name": "testdb2","shardingNode": [{"name": "dn1","dbGroup": "ha_group1","database": "db_1"}, {"name": "dn2","dbGroup": "ha_group1","database": "db_2"}, {"name": "dn3","dbGroup": "ha_group2","database": "db_3"}, {"name": "dn4","dbGroup": "ha_group2","database": "db_4"}], "function": [{"name": "func_enum","clazz": "Enum","property": [{"value": "partition-enum.txt","name": "mapFile"}, {"value": "0","name": "defaultNode"}, {"value": "1","name": "type"}]}, {"user": [{"type": "ManagerUser","properties": {"readOnly": false,"name": "man1","password": "654321","usingDecrypt": "false","maxCon": 10}}, {"type": "ShardingUser","properties": {"schemas": "testdb","readOnly": false,"blacklist": "blacklist1","name": "root","password": "123456","maxCon": 20}}, {"type": "RwSplitUser","properties": {"dbGroup": "ha_group3","blacklist": "blacklist1","name": "rwsu1","password": "123456","maxCon": 20}}, {"blacklist": [{"name": "blacklist1"}]}], "sequence_db_conf.properties": {"`TESTDB`.`GLOBAL`": "dn1", "`TESTDB`.`COMPANY`": "dn1", "`TESTDB`.`CUS-  
TOMER`": "dn1", "`TESTDB`.`ORDERS`": "dn1", "`TESTDB`.`myauto_test`": "dn1"}]}
1 row in set (0.33 sec)
```

```
{
  "version": "4.0",
  "dbGroup": [
    {
      "rwSplitMode": 0,
      "name": "ha_group1",
      "delayThreshold": 100,
      "disableHA": "true",
      "heartbeat": {
        "value": "select user()"
      },
      "dbInstance": [
        {
          "name": "hostM1",
          "url": "***",
          "password": "123456",
          "user": "root",
          "maxCon": 200,
          "minCon": 10,
          "usingDecrypt": "false",
          "disabled": "false",
          "id": "hostM1Id",
          "readWeight": "10",
          "primary": true
        },
        {
          "name": "hostM5",
          "url": "***",
          "password": "123456",
          "user": "root",
          "maxCon": 15,
          "minCon": 15,
          "disabled": "false",
          "primary": false
        }
      ]
    },
    {
      "rwSplitMode": 0,
      "name": "ha_group2",
      "heartbeat": {
        "value": "select user()"
      },
      "dbInstance": [
        {
          "name": "hostM2",
          "url": "***",
          "password": "123456",
          "user": "root",
          "maxCon": 200,
          "minCon": 10,
          "primary": true
        }
      ]
    }
  ],
  "schema": [
    {
      "name": "testdb",
      "sqlMaxLimit": 100,
      "shardingNode": "dn1",
      "table": [
        {
          "type": "ShardingTable",
          "properties": {
            "function": "func_enum",
            "shardingColumn": "code",
            "name": "tb_enum_sharding",
            "shardingNode": "dn1,dn2"
          }
        },
        {
          "type": "GlobalTable",
          "properties": {
            "name": "test1",
            "shardingNode": "dn1,dn2,dn3,dn4"
          }
        }
      ]
    }
  ],
  "function": [
    {
      "name": "func_enum",
      "clazz": "Enum",
      "property": [
        {"value": "partition-enum.txt", "name": "mapFile"},
        {"value": "0", "name": "defaultNode"},
        {"value": "1", "name": "type"}
      ]
    }
  ],
  "user": [
    {
      "type": "ManagerUser",
      "properties": {
        "readOnly": false,
        "name": "man1",
        "password": "654321",
        "usingDecrypt": "false",
        "maxCon": 10
      }
    },
    {
      "type": "ShardingUser",
      "properties": {
        "schemas": "testdb",
        "readOnly": false,
        "blacklist": "blacklist1",
        "name": "root",
        "password": "123456",
        "maxCon": 20
      }
    },
    {
      "type": "RwSplitUser",
      "properties": {
        "dbGroup": "ha_group3",
        "blacklist": "blacklist1",
        "name": "rwsu1",
        "password": "123456",
        "maxCon": 20
      }
    }
  ],
  "blacklist": [
    {"name": "blacklist1"}
  ],
  "sequence_db_conf.properties": [
    {"`TESTDB`.`GLOBAL`": "dn1", "`TESTDB`.`COMPANY`": "dn1", "`TESTDB`.`CUS-TOMER`": "dn1", "`TESTDB`.`ORDERS`": "dn1", "`TESTDB`.`myauto_test`": "dn1"}
  ]
}
```

```

"dbInstance": [
    {
        "name": "hostM2",
        "url": "***",
        "password": "123456",
        "user": "root",
        "maxCon": 200,
        "minCon": 10,
        "primary": true
    }
],
{
    "rwSplitMode": 0,
    "name": "ha_group3",
    "delayThreshold": -1,
    "heartbeat": {
        "value": "select user()"
    },
    "dbInstance": [
        {
            "name": "hostM3",
            "url": "***",
            "password": "123456",
            "user": "root",
            "maxCon": 15,
            "minCon": 15,
            "disabled": "false",
            "primary": true
        }
    ]
},
],
"schema": [
    {
        "name": "testdb",
        "sqlMaxLimit": 100,
        "shardingNode": "dn1",
        "table": [
            {
                "type": "ShardingTable",
                "properties": {
                    "function": "func_enum",
                    "shardingColumn": "code",
                    "name": "tb_enum_sharding",
                    "shardingNode": "dn1, dn2",
                    "sqlMaxLimit": 200
                }
            },
            {
                "type": "GlobalTable",
                "properties": {
                    "name": "test1",
                    "shardingNode": "dn1, dn2, dn3, dn4"
                }
            }
        ]
    },
    {
        "name": "testdb2",
        "shardingNode": "dn1"
    }
],
"shardingNode": [
    {
        "name": "dn1",
        "dbGroup": "ha_group1",
        "database": "db_1"
    },
    {
        "name": "dn2",
        "dbGroup": "ha_group1",
        "database": "db_2"
    },
    {
        "name": "dn3",
        "dbGroup": "ha_group2",
        "database": "db_3"
    }
]
}

```

```

},
{
  "name":"dn4",
  "dbGroup":"ha_group2",
  "database":"db_4"
}
],
"function":[
  {
    "name":"func_enum",
    "clazz":"Enum",
    "property":[
      {
        "value":"partition-enum.txt",
        "name":"mapFile"
      },
      {
        "value":"0",
        "name":"defaultNode"
      },
      {
        "value":"1",
        "name":"type"
      }
    ]
  }
],
"user":[
  {
    "type":"ManagerUser",
    "properties":{
      "readOnly":false,
      "name":"man1",
      "password":"654321",
      "usingDecrypt":false,
      "maxCon":10
    }
  },
  {
    "type":"ShardingUser",
    "properties":{
      "schemas":"testdb",
      "readOnly":false,
      "blacklist":"blacklist1",
      "name":"root",
      "password":"123456",
      "maxCon":20
    }
  },
  {
    "type":"RwSplitUser",
    "properties":{
      "dbGroup":"ha_group3",
      "blacklist":"blacklist1",
      "name":"rwsu1",
      "password":"123456",
      "maxCon":20
    }
  }
],
"blacklist":[
  {
    "name":"blacklist1"
  }
],
"sequence_db_conf.properties":{
  ``TESTDB``.`GLOBAL`":"dn1",
  ``TESTDB``.`COMPANY`":"dn1",
  ``TESTDB``.`CUSTOMER`":"dn1",
  ``TESTDB``.`ORDERS`":"dn1",
  ``TESTDB``.`myauto_test`":"dn1"
}
}

```

dble_configdble

2.1

- [2.1.1 select](#)
- [2.1.2 set](#)
- [2.1.3 show](#)
- [2.1.4 switch](#)
- [2.1.5 kill](#)
- [2.1.6 stop](#)
- [2.1.7 reload](#)
- [2.1.8 rollback](#)
- [2.1.9 offline](#)
- [2.1.10 online](#)
- [2.1.11 file](#)
- [2.1.12 log](#)
- [2.1.13](#)
- [2.1.14 pause & resume](#)
- [2.1.15](#)
- [2.1.16 /](#)
- [2.1.17 check @@metadata](#)
- [2.1.18 release @@reload_metadata](#)
- [2.1.19 split](#)
- [2.1.20 flow_control](#)
- [2.1.21](#)
- [2.1.22](#)

2.1.1 select

2.1.1.1 select @@VERSION_COMMENT

```
select @@VERSION_COMMENT;
```

dble

```
MySQL [(none)]> select @@VERSION_COMMENT;
+-----+
| @@VERSION_COMMENT      |
+-----+
| dble Server (ActionTech) |
+-----+
1 row in set (0.02 sec)
```

2.1.1.2 select @@SESSION.TX_READ_ONLY/ select @@SESSION.Transaction_READ_ONLY

```
select @@SESSION.TX_READ_ONLY;
```

```
select @@SESSION.Transaction_READ_ONLY
```

readonly

2.1.1.3 select @@max_allowed_packet

```
select @@max_allowed_packet;
```

1.mysql+1024dblemysqlmysql max_allowed_packet dble
 2.dble
 3. show variables like 'max_allowed_packet' mysql dble
 4.dbлемysql

```
mysql> select @@max_allowed_packet;
+-----+
| @@max_allowed_packet |
+-----+
|          16776640 |
+-----+
1 row in set (0.01 sec)
```

2.1.1.4 select TIMEDIFF(NOW(), UTC_TIMESTAMP())

```
select TIMEDIFF(NOW(), UTC_TIMESTAMP())
```

00:00:00

2.1.2 set xxx

set xxx;

xxx

OK

2.1.3 show

2.1.3.1 show @@time.current

```
show @@time.current;
```

2.1.3.2 show @@time.startup

```
show @@time.startup;
```

2.1.3.3 show @@version

```
show @@version;
```

dble

2.1.3.4 show @@server

```
show @@server;
```

dble

```
mysql> show @@server;
+-----+-----+-----+-----+-----+-----+
| UPTIME      | USED_MEMORY | TOTAL_MEMORY | MAX_MEMORY | RELOAD_TIME          | CHARSET | STATUS |
+-----+-----+-----+-----+-----+-----+
| 1h 4m 47s |     17414592 |    87031808 | 1840250880 | 2017/10/17 16:42:09 | utf8   | ON    |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.05 sec)
```

UPTIME:
USED_MEMORY:
TOTAL_MEMORY:
MAX_MEMORY:
RELOAD_TIME: config
CHARSET: COLLATE
STATUS:

2.1.3.5 show @@threadpool / show @@threadpool.task

```
show @@threadpool;
```

```
mysql> show @@threadpool;
+-----+-----+-----+-----+-----+-----+
| NAME           | POOL_SIZE | ACTIVE_COUNT | TASK_QUEUE_SIZE | COMPLETED_TASK | TOTAL_TASK |
+-----+-----+-----+-----+-----+-----+
| Timer          |      1 |        0 |            0 |       22596 |     22596 |
| frontWorker    |      8 |        8 |            0 |        216 |     217 |
| managerFrontWorker |      2 |        2 |            0 |        216 |     217 |
| backendWorker  |      8 |        8 |            0 |        216 |     217 |
| complexQueryWorker |      8 |        0 |            0 |         0 |      0 |
| writeToBackendWorker |      8 |        8 |            0 |         0 |      0 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.03 sec)
```

NAME:

POOL_SIZE:
ACTIVE_COUNT:
TASK_QUEUE_SIZE:
COMPLETED_TASK:
TOTAL_TASK:

- ACTIVE_COUNT/TASK_QUEUE_SIZE/COMPLETED_TASK/TOTAL_TASK dble frontWorkerwriteToBackendWorker "" "" show
@@threadpool.task

show @@threadpool.task;

```
mysql> show @@threadpool.task;
+-----+-----+-----+-----+-----+
| NAME | POOL_SIZE | ACTIVE_TASK_COUNT | TASK_QUEUE_SIZE | COMPLETED_TASK | TOTAL_TASK |
+-----+-----+-----+-----+-----+
| Timer | 1 | 0 | 0 | 100 | 100 |
| frontWorker | 8 | 8 | 0 | 45 | 46 |
| managerFrontWorker | 2 | 2 | 0 | 45 | 46 |
| backendWorker | 8 | 8 | 0 | 1631 | 1631 |
| complexQueryWorker | 8 | 0 | 0 | 98 | 98 |
| writeToBackendWorker | 8 | 8 | 0 | 0 | 0 |
+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

NAME:
POOL_SIZE:
ACTIVE_TASK_COUNT:
TASK_QUEUE_SIZE:
COMPLETED_TASK:
TOTAL_TASK:

2.1.3.6 show @@database

show @@database;

schema

2.1.3.7 show @@shardingnode

show @@shardingnode;

shardingnode

```
mysql> show @@shardingnode;
+-----+-----+-----+-----+-----+-----+
| NAME | DB_GROUP | SCHEMA_EXISTS | ACTIVE | IDLE | SIZE | EXECUTE | RECOVERY_TIME |
+-----+-----+-----+-----+-----+-----+
| dn1 | dh1/dble_test | true | 0 | 0 | 1000 | 34 | -1 |
| dn2 | dh2/dble_test | true | 0 | 0 | 1000 | 34 | -1 |
| dn3 | dh1/dble2_test | false | 0 | 0 | 1000 | 26 | -1 |
| dn4 | dh2/dble2_test | true | 0 | 0 | 1000 | 26 | -1 |
| dn5 | dh1/nosharding | true | 0 | 0 | 1000 | 9 | -1 |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.09 sec)
```

NAME:
DB_GROUP: dbGroupName/schema
SCHEMA_EXISTS: true/false
ACTIVE:
IDLE: (bug)
SIZE: maxCon
EXECUTE:
RECOVERY_TIME: (stop @@heartbeat)

schemashardingnode

show @@shardingnode where schema=xxx;

xxxschema

2.1.3.8 show @@dbinstance

show @@dbinstance

dbinstance

```
mysql> show @@dbinstance;
+-----+-----+-----+-----+-----+-----+-----+-----+
| DB_GROUP | NAME      | HOST          | PORT | W/R | ACTIVE | IDLE | SIZE | EXECUTE | READ_LOAD | WRITE_LOAD | DISABLED |
+-----+-----+-----+-----+-----+-----+-----+-----+
| localhost2 | hostS1 | 10.18x.2x.63 | 3307 | W   | 1       | 9     | 100  | 11    | 0        | 0        | true   |
| localhost1 | hostM1 | 10.18x.2x.64 | 3306 | W   | 1       | 9     | 100  | 17    | 0        | 0        | false  |
+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.09 sec)
```

```
DB_GROUP:dbinstanceDB_GROUP
NAME: dbinstance
HOST: host
PORT:
W/R:
ACTIVE: ,dbinstance
IDLE: ,dbinstance(bug)
SIZE: maxCon
EXECUTE: ,dbinstance
READ_LOAD: selectshow ()
WRITE_LOAD: selectshowsqliWRITE_LOAD()
DISABLED: db.xmldbinstance (2.19.09.0disabledtrue)
```

shardingnodedbinstance

show @@dbinstance where shardingnode=xxx;

xxxshardingnode

2.1.3.9 show @@dbinstance.synstatus

show @@dbinstance.synstatus;

dbinstance

: heartbeat show slave statusdb.xml

```
mysql> show @@dbinstance.synstatus \G
***** 1. row *****
DB_GROUP: dbGroup2
NAME: instanceM3
HOST: 111.231.25.141
PORT: 30309
MASTER_HOST: mysql3
MASTER_PORT: 3306
MASTER_USER: replicator
SECONDS_BEHIND_MASTER: 0
SLAVE_IO_RUNNING: Yes
SLAVE_SQL_RUNNING: Yes
SLAVE_IO_STATE: Waiting for master to send event
CONNECT_RETRY: 10
LAST_IO_ERROR:
1 row in set (0.00 sec)
```

```
DB_GROUP:dbinstanceDB_GROUP
NAME: dbinstance
HOST: /ip
```

PORT:

mysqlshow slave status

2.1.3.10 show @@dbinstance.syndetail where name=?

show @@dbinstance.syndetail where name=xxx;

xxxdbinstance

24dbinstance

```
mysql> show @@dbinstance.syndetail WHERE name =hostM2;
+-----+-----+-----+-----+-----+-----+-----+-----+
| DB_GROUP | NAME   | HOST      | PORT | MASTER_HOST | MASTER_PORT | MASTER_USER | TIME           | SECONDS_BEHIND_MASTER |
+-----+-----+-----+-----+-----+-----+-----+-----+
| localhost2 | hostM2 | 10.18x.2x.64 | 3320 | 10.18x.2x.62 | 3320 | qrep     | 2017-10-17 18:31:27 | -1 |
| localhost2 | hostM2 | 10.18x.2x.64 | 3320 | 10.18x.2x.62 | 3320 | qrep     | 2017-10-17 18:31:57 | -1 |
| localhost2 | hostM2 | 10.18x.2x.64 | 3320 | 10.18x.2x.62 | 3320 | qrep     | 2017-10-17 18:32:27 | -1 |
| localhost2 | hostM2 | 10.18x.2x.64 | 3320 | 10.18x.2x.62 | 3320 | qrep     | 2017-10-17 18:32:57 | -1 |
+-----+-----+-----+-----+-----+-----+-----+-----+
4 row in set (0.05 sec)
```

:

DB_GROUP:dbinstanceDB_GROUP
 NAME: dbinstance
 HOST: /ip
 PORT:

mysqlshow slave status

2.1.3.11 show @@datasource.cluster

show @@datasource.cluster;

2.20.04.0

2.1.3.12 show @@processor

show @@processor;

dbleprocessor

```
mysql> show @@processor\G
***** 1. row *****
  NAME: frontProcessor0
  NET_IN: 0
  NET_OUT: 0
REACT_COUNT: 0
  R_QUEUE: 0
  W_QUEUE: 0
FREE_BUFFER: 1072169008
TOTAL_BUFFER: 1073741824
  BU_PERCENT: 0
  BU_WARNs: 0
  FC_COUNT: 0
  BC_COUNT: 0
***** 2. row *****
  NAME: frontProcessor1
  NET_IN: 0
  NET_OUT: 267
REACT_COUNT: 0
  R_QUEUE: 0
  W_QUEUE: 0
FREE_BUFFER: 1072169008
TOTAL_BUFFER: 1073741824
  BU_PERCENT: 0
  BU_WARNs: 0
  FC_COUNT: 0
  BC_COUNT: 0
***** 3. row *****
  NAME: frontProcessor2
```

```

NET_IN: 0
NET_OUT: 150
REACT_COUNT: 0
R_QUEUE: 0
W_QUEUE: 0
FREE_BUFFER: 1072169008
TOTAL_BUFFER: 1073741824
BU_PERCENT: 0
BU_WARNS: 0
FC_COUNT: 0
BC_COUNT: 0
***** 4. row *****
NAME: frontProcessor3
NET_IN: 0
NET_OUT: 1548
REACT_COUNT: 0
R_QUEUE: 0
W_QUEUE: 0
FREE_BUFFER: 1072169008
TOTAL_BUFFER: 1073741824
BU_PERCENT: 0
BU_WARNS: 0
FC_COUNT: 0
BC_COUNT: 0
...

```

```

NAME:
NET_IN:
NET_OUT:
REACT_COUNT: 0
R_QUEUE: 0
W_QUEUE:
FREE_BUFFER: BufferPool free
TOTAL_BUFFER: BufferPool
BU_PERCENT: BufferPool
BU_WARNS: 0
FC_COUNT:
BC_COUNT:

```

2.1.3.13 show @@command

show @@command;

processor

```

mysql> show @@command;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| PROCESSOR | INIT_DB | QUERY | STMT_PREPARE | STMT_EXECUTE | STMT_CLOSE | PING | KILL | QUIT | OTHER |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Processor0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Processor1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Processor2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Processor3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

```

```

PROCESSOR: processor
INIT_DB: COM_INIT_DB
QUERY: COM_QUERY
STMT_PREPARE: COM_STMT_PREPARE
STMT_EXECUTE: COM_STMT_EXECUTE
STMT_CLOSE: COM_STMT_CLOSE
PING: COM_PING
KILL: COM_PROCESS_KILL
QUIT: COM_QUIT
OTHER:

```

2.1.3.14 show @@connection where processor=? and front_id=? and host=? and user=?

```
show @@connection where processor=? and front_id=? and host=? and user=?;
```

processorfront_idhostuser

```
mysql> show @@connection where processor='frontProcessor4' \G
***** 1. row *****
PROCESSOR: frontProcessor4
FRONT_ID: 4
HOST: 192.168.2.190
PORT: 9066
LOCAL_PORT: 52082
USER: man1
SCHEMA:
CHARACTER_SET_CLIENT: utf8mb4
COLLATION_CONNECTION: utf8mb4_general_ci
CHARACTER_SET_RESULTS: utf8mb4
NET_IN: 1438
NET_OUT: 10925
ALIVE_TIME(S): 526
RECV_BUFFER: 32767
SEND_QUEUE: 0
RECV_QUEUE: 0
TX_ISOLATION_LEVEL:
AUTOCOMMIT:
SYS_VARIABLES:
USER_VARIABLES:
XA_ID: -
1 row in set (0.01 sec)
```

```
PROCESSOR: PROCESSOR
FRONT_ID: ID
HOST: host
PORT: ()
LOCAL_PORT:
USER:
SCHEMA: schema
CHARACTER_SET_CLIENT:
COLLATION_CONNECTION:
CHARACTER_SET_RESULTS :
NET_IN:
NET_OUT:
ALIVE_TIME(S):
RECV_BUFFER: ()
SEND_QUEUE:
RECV_QUEUE:
TX_ISOLATION_LEVEL:
AUTOCOMMIT:
SYS_VARIABLES:
USER_VARIABLES:
```

2.1.3.15 show @@cache

```
show @@cache;
```

cache

```
mysql> show @@cache;
+-----+-----+-----+-----+-----+-----+
| CACHE | MAX | CUR | ACCESS | HIT | PUT | LAST_ACCESS | LAST_PUT |
+-----+-----+-----+-----+-----+-----+
| ER_SQL2PARENTID | 1000 | 0 | 0 | 0 | 0 | | |
| SQLRouteCache | 10000 | 0 | 0 | 0 | 0 | | |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.09 sec)
```

:

```
CACHE: cache
MAX:
CUR:
```

```
ACCESS:
HIT:
PUT:
LAST_ACCESS: (yyyy/mm/dd hh:mm:ss)
LAST_INPUT: (yyyy/mm/dd hh:mm:ss)
```

2.1.3.16 show @@backend where processor=? and backend_id=? and mysqlid=? and host=? and port=?

show @@backend where processor=? and backend_id=? and mysqlid=? and host=? and port=?;

show @@sessionprocessorbackend_idmysqlidhostport

```
mysql> show @@backend where processor='backendProcessor9' and host='172.18.0.3' \G
***** 1. row ****
processor: backendProcessor9
BACKEND_ID: 29
MYSQLID: 26
HOST: 172.18.0.3
PORT: 3306
LOCAL_TCP_PORT: 34848
NET_IN: 93
NET_OUT: 85
ACTIVE_TIME(S): 699
CLOSED: false
STATE: IDLE
SEND_QUEUE: 0
SCHEMA: NULL
CHARACTER_SET_CLIENT: utf8mb4
COLLATION_CONNECTION: utf8mb4_general_ci
CHARACTER_SET_RESULTS: utf8mb4
TX_ISOLATION_LEVEL: 2
AUTOCOMMIT: true
SYS_VARIABLES:
USER_VARIABLES:
XA_STATUS: 0
DEAD_TIME:
USED_FOR_HEARTBEAT: false
1 row in set (0.01 sec)
```

```
processor: processor
BACKEND_ID: ID
MYSQLID: mysqlid(show processlistMYSQLID)
HOST:
PORT:
LOCAL_TCP_PORT: tcp
NET_IN:
NET_OUT:
ACTIVE_TIME(S):
CLOSED:
STATE: IN USEIDLEHEARTBEAT CHECKEVICTIN CREATION OR OUT OF POOLUNKNOWN STATE
SEND_QUEUE:
SCHEMA: schema
CHARACTER_SET_CLIENT:
COLLATION_CONNECTION:
CHARACTER_SET_RESULTS:
TX_ISOLATION_LEVEL: -1
AUTOCOMMIT:
SYS_VARIABLES:
USER_VARIABLES:
XA_STATUS: xa
DEAD_TIME
USED_FOR_HEARTBEAT:
```

2.1.3.17 show @@session

show @@session;

session

```
mysql> show @@session ;
+-----+-----+-----+
```

```
| FRONT_ID | DN_COUNT | DN_LIST
+-----+-----+
| 2       | 2       | BackendConnection[backendId=59, host=172.100.9.5 [, ... ]] |
+-----+-----+
1 row in set (0.00 sec)
```

FRONT_ID: ID
DN_COUNT:
DN_LIST: ,

DN_LIST

```
BackendConnection[id = 15 host = **** port = 3306 localPort = 56355 mysqlId = 53690 db config = dbInstance[name=hostM1,disabled=false,maxCon=6000,minCon=17]
```

:

```
id: id
host: host ip
port:
localPort: dbled
mysqlId: idshow processlist
db configdble
  name
  disabled
  maxCon
  minCon
```

2.1.3.18 show @@connection.sql

show @@connection.sql;

sessionSQL

```
mysql> show @@connection.sql;
+-----+-----+-----+-----+-----+-----+-----+
| FRONT_ID | HOST          | USER        | SCHEMA      | START_TIME           | EXECUTE_TIME | SQL           | STAGE
+-----+-----+-----+-----+-----+-----+-----+
|     1    | 0:0:0:0:0:0:0:1 | man         | NULL        | 2017/10/17 17:00:58 |         139   | show @@connection.sql | Read SQL
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.13 sec)
```

:

FRONT_ID: ID
HOST: host
USER:
SCHEMA: schema
START_TIME:
EXECUTE_TIME: SQL20ms
SQL10241024
STAGE: ,finished

2.1.3.19 show @@sql

show @@sql;

:sql_log

```
mysql> show @@sql;
+-----+-----+-----+-----+
| ID   | USER  | START_TIME           | EXECUTE_TIME | SQL
+-----+-----+-----+-----+
|     1 | root   | 2017/10/17 17:37:22 |         381   | select * from sharding_two_node LIMIT 100
+-----+-----+-----+-----+
1 row in set (0.02 sec)
```

:

ID:
USER:
START_TIME:
EXECUTE_TIME:
SQL

SQL

```
select sql_id as ID, user as USER, start_time as START_TIME, duration as EXECUTE_TIME, sql_stmt as SQL from dble_information.sql_log order by start_time desc
```

2.1.3.20 show @@sql.high

```
show @@sql.high;
sql_log
```

```
mysql> show @@sql.high;
+-----+-----+-----+-----+-----+-----+-----+-----+
| ID   | USER  | FREQUENCY | AVG_TIME | MAX_TIME | MIN_TIME | EXECUTE_TIME | LAST_TIME      | SQL
|-----+-----+-----+-----+-----+-----+-----+-----+
| 1    | root   |        1 |      381 |      381 |      381 |      381 | 2017/10/17 17:37:23 | SELECT * FROM sharding_two_node LIMIT ?
|-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.06 sec)
```

ID:
USER:
FREQUENCY: sql
AVG_TIME:
MAX_TIME:
MIN_TIME:
EXECUTE_TIME:
LAST_TIME:
SQL

SQL

```
select sql_id as ID, user as USER, count(0) as FREQUENCY, avg(duration) AVG_TIME, max(duration) as MAX_TIME, min(duration) as MIN_TIME, duration as EXECUTE_TIME, start_time as LAST_TIME, sql_digest as SQL from dble_information.sql_log group by sql_digest,user order by start_time
```

2.1.3.21 show @@sql.slow

```
show @@sql.slow;
sql_log  sqlSlowTime (100ms, )sql
```

```
mysql> show @@sql.slow;
+-----+-----+-----+-----+
| USER | START_TIME          | EXECUTE_TIME | SQL
+-----+-----+-----+-----+
| root | 2017/10/17 17:37:22 |       381 | select * from sharding_two_node LIMIT 100 |
+-----+-----+-----+-----+
1 row in set (0.07 sec)
```

USER:
START_TIME:
EXECUTE_TIME:
SQL

SQL

```
select user as USER, start_time as START_TIME, duration as EXECUTE_TIME, sql_stmt as SQL from dble_information.sql_log where duration >= ${slowTime}*1000000 order by start_time
```

2.1.3.22 show @@sql.resultset**show @@sql.resultset;**

sql_logsql maxResultSet (512K)sql

```
mysql> show @@sql.resultset;
+-----+-----+-----+-----+
| ID   | USER  | FREQUENCY | SQL
+-----+-----+-----+-----+
|    1 | root  |       1 | SELECT * FROM sharding_two_node | 1048576
+-----+-----+-----+-----+
1 row in set (0.05 sec)
```

ID:
USER:
FREQUENCY:sql
SQL:
RESULTSET_SIZE:

SQL

```
select sql_id as ID, user as USER, t2.FREQUENCY, sql_stmt as SQL, result_size as RESULT_SIZE from dble_information.sql_log t1
inner join (select max(sql_id) as maxId, count(0) as FREQUENCY from dble_information.sql_log group by sql_digest having result_size >= ${maxResultSet} order by maxId) t2 on t1.sql_id = t2.maxId;
```

2.1.3.23 show @@sql.sum**show @@sql.sum;**

sql .user.true

```
mysql> show @@sql.sum;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| ID   | USER  | R    | W    | R%   | MAX  | NET_IN | NET_OUT | TIME_COUNT | TTL_COUNT | LAST_TIME
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|    1 | root  | 1   | 0   | 1.00 | 1    | 41    | 840    | [0, 0, 1, 0] | [0, 0, 1, 0] | 2017/10/17 17:37:23 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.26 sec)
```

:

ID:
USER:
R:(selectshowdescexplain)
W:(insertupdatedeleteDDLsql)
R%:R/(R+W)*100%
MAX:
NET_IN:
NET_OUT:
TIME_COUNT:query22-06 ,06-13 ,13-18,18-22
TTL_COUNT:query10,10 - 200,1, 1
LAST_TIME:SQL

show @@sql.sum true;

2.1.3.24 show @@sql.sum.user

show @@sql.sum;

```
show @@sql.sum.user true;
```

2.1.3.25 show @@sql.sum.table

```
show @@sql.sum.table;
```

```
mysql> show @@sql.sum.table;
+-----+-----+-----+-----+-----+-----+
| ID   | TABLE          | R    | W    | R%   | RELATABLE | RELACOUNT | LAST_TIME        |
+-----+-----+-----+-----+-----+-----+
| 1    | sharding_two_node | 1 | 0 | 1.00 | NULL      | NULL       | 2017/10/17 17:37:23 |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.06 sec)
```

:

```
ID:
TABLE:
R:(selectshowdescexplain)
W:(insertupdatedeleteDDLsql)
R%:R/(R+W)*100%
RELATABLE:(,NULL)
RELACOUNT:(,NULL)
LAST_TIME:SQL
```

```
show @@sql.sum.table true;
```

2.1.3.26 show @@heartbeat

```
show @@heartbeat;
```

```
dbinstanceheartbeat
```

```
mysql> show @@heartbeat;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| NAME   | HOST          | PORT | RS_CODE | RETRY | STATUS | TIMEOUT | EXECUTE_TIME | LAST_ACTIVE_TIME | STOP   | RS_MESSAGE |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| hostM1 | 10.18x.2x.63 | 3320 | OK     | 0     | idle   | 0     | 8,8,8       | NULL             | false  | NULL      |
| hostM2 | 10.18x.2x.64 | 3320 | OK     | 0     | idle   | 0     | 9,9,9       | NULL             | false  | NULL      |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.07 sec)
```

```
NAME:dbGroup
HOST:/IP
PORT:
RS_CODE:INIT, OK, ERROR, TIMEOUT
RETRY:
STATUS:checking/idle
TIMEOUT:(db.xmlheartbeattimeout0)
EXECUTE_TIME:311030
LAST_ACTIVE_TIME:
STOP:stop,stop
RS_MESSAGE:RS_CODEINIT, OK, TIMEOUTmessagenullRS_CODEERRORmessage
```

2.1.3.27 show @@heartbeat.detail where name=

```
show @@heartbeat.detail where name=xxx;
```

```
xxxdbinstance
```

```
dbinstanceheartbeat
:shardingNodeHeartbeatPeriod
```

:

```
mysql> show @@heartbeat.detail where name='hostM1';
+-----+-----+-----+-----+
```

```
| NAME      | HOST          | PORT | TIME           | EXECUTE_TIME |
+-----+-----+-----+-----+
| hostM1   | 10.18x.2x.63 | 3320 | 2017-10-17 17:31:58 | 7
| hostM1   | 10.18x.2x.63 | 3320 | 2017-10-17 17:32:59 | 9
+-----+-----+-----+-----+
2 row in set (0.00 sec)
```

:

```
NAME:dbGroup
HOST:/IP
PORT:
TIME:
EXECUTE_TIME:()
```

2.1.3.28 show @@sysparam**show @@sysparam;**

sysconfig

2.1.3.29 show @@white**show @@white;**

```
mysql> show @@white;
+-----+-----+
| IP        | USER |
+-----+-----+
| 0:0:0:0:0:0:1 | root |
| 127.0.0.1    | root |
| 0:0:0:0:0:0:1 | test |
| 127.0.0.1    | test |
+-----+-----+
4 rows in set (0.00 sec)
```

2.1.3.30 show @@directmemory**show @@directmemory;**

```
+-----+-----+-----+
| DIRECT_MEMORY_MAXED | DIRECT_MEMORY_POOL_SIZE | DIRECT_MEMORY_POOL_USED |
+-----+-----+-----+
| 3GB                | 1024MB            | 44KB                 |
+-----+-----+-----+
1 row in set (0.16 sec)
```

:

```
DIRECT_MEMORY_MAXED:-XX:MaxDirectMemorySize
DIRECT_MEMORY_POOL_SIZE: bufferPoolPageSizebufferPoolPageNumber
DIRECT_MEMORY_POOL_USEDDirectMemory
```

2.1.3.31 show @@command.count**show @@command.count;****2.1.3.32 show @@connection.count****show @@connection.count;**

2.1.3.33 show @@backend.statistics

```
show @@backend.statistics;
```

```
MySQL [(none)]> show @@backend.statistics;
+-----+-----+-----+-----+
| HOST      | PORT     | ACTIVE    | TOTAL    |
+-----+-----+-----+-----+
| 192.168.2.177 | 3307    | 0        | 10       |
| 192.168.2.177 | 3308    | 0        | 10       |
+-----+-----+-----+-----+
2 rows in set (0.02 sec)
```

HOST
PORT
ACTIVE
TOTAL

2.1.3.34 show @@backend.old

```
show @@backend.old;
```

```
reload @@config_all
show @@backend
```

2.1.3.35 show @@binlog.status

```
show @@binlog.status;
```

```
sharding.xmlmysqlbinlog
```

```
mysql> show @@binlog.status;
+-----+-----+-----+-----+-----+-----+
| Url          | File           | Position | Binlog_Do_DB | Binlog_Ignore_DB | Executed_Gtid_Set |
+-----+-----+-----+-----+-----+-----+
| 10.18x.2x.63:3320 | mysql-bin.000024 | 14128    |           |                 | 7ad71aab-de94-11e5-9488-3a935460da28:1-67646 |
| 10.18x.2x.64:3320 | mysql-bin.000049 | 604440   |           |                 | ba8f8b5c-debf-11e5-a87b-26b8a61f9012:1-91    |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.11 sec)
```

Url: Url
show master status

2.1.3.36 show @@help

```
show @@help;
```

2.1.3.37 show @@sql.large

```
show @@sql.large;
```

```
sql_logselect sql10000
```

```
mysql> show @@sql.large;
+-----+-----+-----+-----+
| USER | ROWS | START_TIME          | EXECUTE_TIME | SQL          |
+-----+-----+-----+-----+
```

```
| root | 20000 | 2017/10/17 17:37:23 | 381           | SELECT * FROM sharding_two_node LIMIT ? |
+-----+-----+-----+-----+
1 row in set (0.06 sec)
```

:

```
USER:
ROWS:
START_TIME: EXECUTE_TIME:
SQL
```

SQL

```
select user as USER, rows as ROWS, start_time as START_TIME, duration as EXECUTE_TIME, sql_stmt as SQL from dble_information.sql_log where
sql_type='Select' and rows > 10000;
```

2.1.3.38 show @@sql.condition

show @@sql.condition;

```
reload @@query_cf table&columns 100000
select from sharding_two_node where id =0; select from sharding_two_node where id =1;
```

```
mysql> show @@sql.condition;
+-----+-----+-----+
| ID   | KEY              | VALUE | COUNT |
+-----+-----+-----+
| 2    | sharding_two_node.id | 0     | 1      |
| 3    | sharding_two_node.id | 1     | 2      |
| 2    | sharding_two_node.id.valuekey | size | 2      |
| 3    | sharding_two_node.id.valuecount | total | 3      |
+-----+-----+-----+
4 rows in set (0.05 sec)
```

:

```
ID:
KEY: schema.table schema.table.valuekey schema.table.valuecount
VALUE: keyvalue
COUNT:
```

2.1.3.39 show @@cost_time;

show @@cost_time;

```
query,bootstrap,cnfuseCostTimeStat
```

```
mysql> show @@cost_time;
+-----+-----+
| OVER_ALL(us) | FRONT_PREPARE          | BACKEND_EXECUTE          |
+-----+-----+
| 71496 | Id:9,Time:53135;Id:12,Time:54056 | Id:9,Time:16924;Id:12,Time:16006 |
| 15316 | Id:17,Time:2301;Id:11,Time:3196 | Id:17,Time:10691;Id:11,Time:11397 |
+-----+-----+
2 rows in set (0.05 sec)
```

:

```
OVER_ALL:
FRONT_PREPARE: dble
BACKEND_EXECUTE:
```

2.1.3.40 show @@shardingNodes where schema=? and table=?;

show @@shardingNodes

```
mysql> show @@shardingNodes where schema=testdb and table=seqtest;
+-----+-----+-----+-----+-----+
| NAME | SEQUENCE | HOST          | PORT | PHYSICAL_SCHEMA | USER | PASSWORD |
+-----+-----+-----+-----+-----+
| dn1  | 0        | 10.186.24.113 | 3309 | db1           | root | 123456   |
| dn2  | 1        | 10.186.24.113 | 3309 | db2           | root | 123456   |
+-----+-----+-----+-----+-----+
2 rows in set (0.05 sec)
```

:

NAME:
SEQUENCE:
HOST:IP
PORT
PHYSICAL_SCHEMA
USER
PASSWORD

2.1.3.41 show @@algorithm where schema=? and table=?;**show @@algorithm**

```
mysql> show @@algorithm where schema=testdb and table=seqtest;
+-----+-----+
| KEY      | VALUE
+-----+-----+
| TYPE     | SHARDING TABLE
| COLUMN   | ID
| CLASS    | com.actiontech.dble.route.function.PartitionByLong
| partitionCount | 2
| partitionLength | 1
+-----+-----+
5 rows in set (0.05 sec)
```

:

KEY:
VALUE

2.1.3.42 show @@thread_used;**show @@thread_used;**

```
mysql> show @@thread_used;
+-----+-----+-----+-----+
| THREAD_NAME          | LAST_QUARTER_MIN | LAST_MINUTE | LAST_FIVE_MINUTE |
+-----+-----+-----+-----+
| 0-NIOBackendRW      | 0%              | 0%          | 0%              |
| 0-NIOFrontRW         | 0%              | 0%          | 0%              |
| 0-backendWorker       | 0%              | 0%          | 0%              |
| 0-frontWorker        | 0%              | 0%          | 0%              |
| 0-managerFrontWorker | 0%              | 0%          | 0%              |
| 0-writeToBackendWorker| 0%              | 0%          | 0%              |
| 1-backendWorker       | 0%              | 0%          | 0%              |
| 1-frontWorker         | 0%              | 0%          | 0%              |
| 1-managerFrontWorker | 0%              | 0%          | 0%              |
+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

:

THREAD_NAME:
LAST_QUARTER_MIN15
LAST_MINUTE
LAST_FIVE_MINUTE

2.1.3.43 show @@ddl;

show @@ddl;

dbleDDL

```
mysql> show @@ddl;
+-----+-----+
| Schema | Table      | Sql
+-----+-----+
| testdb | sharding_two_node | alter table sharding_two_node add column id2 int |
| mytest | sharding_four_node | drop table sharding_four_node
+-----+
2 rows in set (0.00 sec)
```

:

```
Schema:Schema
TableTable
Sql ddl sql
```

2.1.3.44 show @@processlist;

show @@processlist;

NULL

```
mysql> show @@processlist;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Front_Id | db_instance | MysqlId | User | Front_Host      | db   | Command | Time | State | Info |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|     1 | instanceM2  |    2303 | root | 127.0.0.1:33222 | db2 | Sleep   |  17 |       | NULL |
|     2 | instanceM2  |    NULL | man1 | 127.0.0.1:34882 | NULL | NULL    |  0 |       | NULL |
|     3 | instances2   |    2259 | root | 127.0.0.1:33226 | db1 | Sleep   |  4 |       | NULL |
|     3 | instances2   |    2308 | root | 127.0.0.1:33226 | db2 | Sleep   |  4 |       | NULL |
|     3 | instances2   |    2304 | root | 127.0.0.1:33226 | db1 | Sleep   |  4 |       | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.05 sec)
```

:

```
Front_IdID
db_instance
MysqlId mysql ID
User
Front_Host
db mysql 'show processlist' db
Commandmysql mysql 'show processlist' Command
Timemysqlstate mysql 'show processlist' Time
Statemysql mysql 'show processlist' State
Infomysql mysql 'show processlist' Info
```

2.1.3.45 show @@session.xa;

show @@session.xa;

xa

```
mysql> show @@session.xa;
+-----+-----+-----+
| FRONT_ID | XA_ID           | XA_STATE          | SHARDING_NODES   |
+-----+-----+-----+
| 1        | 'Dble_Server.1.1' | TX_COMMIT_FAILED_STATE | dn1,dn3
+-----+-----+-----+
1 rows in set (0.00 sec)
```

:

```
FRONT_IDID
XA_IDxaid
```

```
XA_STATExa
SHARDING_NODEShashingNode
```

2.1.3.46 show @@reload_status

show @@reload_status

dblereload

```
+-----+-----+-----+-----+-----+-----+-----+
| INDEX | CLUSTER | RELOAD_TYPE | RELOAD_STATUS | LAST_RELOAD_START | LAST_RELOAD_END | TRIGGER_TYPE | END_TYPE |
+-----+-----+-----+-----+-----+-----+-----+
|     0 | No Cluster| RELOAD_ALL | NOT_RELOADING | 2020/06/19 14:28:04 | 2020/06/19 14:28:05 | LOCAL_COMMAND | RELOAD_END |
+-----+-----+-----+-----+-----+-----+-----+
```

:

```
INDEX:reload[RL]
CLUSTER:dble
RELOAD_TYPE:reload RELOAD_ALL/RELOAD_META/MANAGER_INSERT/MANAGER_UPDATE/MANAGER_DELETE
RELOAD_STATUS:reload/not_reloading/self_reload/meta_reload/waiting_others
LAST_RELOAD_START
LAST_RELOAD_END
TRIGGER_TYPE LOCAL_COMMAND/CLUSTER_NOTIFY
END_TYPE RELOAD_END/INTERRUPTED
```

[release @@reload_metadata](#)

2.1.3.47 show @@user

show @@user

dble

```
mysql> show @@user;
+-----+-----+-----+-----+
| Username | Manager | Readonly | Max_con |
+-----+-----+-----+-----+
| man1    | Y      | N       | no limit |
| root    | N      | N       | no limit |
| user    | N      | N       | no limit |
+-----+-----+-----+-----+
3 rows in set (0.03 sec)
```

:

```
Username
Manager
Readonly
Max_con
```

2.1.3.48 show @@user.privilege

show @@user.privilege

dble

```
mysql> show @@user.privilege;
+-----+-----+-----+-----+-----+-----+-----+
| Username | Schema | Table | INSERT | UPDATE | SELECT | DELETE |
+-----+-----+-----+-----+-----+-----+-----+
| root    | testdb1 | *     | Y      | Y      | Y      | Y      |
| root    | testdb  | *     | Y      | Y      | Y      | Y      |
| user    | testdb  | *     | N      | Y      | Y      | N      |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)
```

:

```
Username
Schema
Tabledml, *
INSERT
UPDATE
SELECT
DELETE
```

2.1.3.49 show @@data_distribution where table ='schema.table'

```
show @@data_distribution where table ='schema.table'
```

```
+-----+-----+
| SHARDING_NODE | COUNT |
+-----+-----+
| dn1           | 100   |
| dn2           | 101   |
| dn3           | 98    |
| dn4           | 104   |
+-----+-----+
4 rows in set (0.09 sec)
```

:

```
SHARDING_NODE
COUNT
```

2.1.3.50 show @@Questions

```
show @@Questions
```

```
SQLQUERYTransaction
```

```
mysql> show @@Questions;
+-----+-----+
| Questions | Transactions |
+-----+-----+
| 0         | 0          |
+-----+-----+
```

:

```
Questions:
Transactions()
```

Transactions:

1. sql; 10641046
2. exit(rollback)
3. set'set autocommit=0,autocommit=n,xxxxxxxxxx;' autocommit=nautocommit=nsql
4. sharding;set xa = on/off/1/0'rwsplit'XA start/end/prepare/commit/rollback XXX'sql
5. rwsplitmulti-query(sql,mysql clientdelimiter)multi-querysql(commit)(Transactions+1Questions+1)

2.1.3.51 show @@connection_pool

```
show @@connection_pool
```

```
mysql> show @@connection_pool;
+-----+-----+-----+-----+
| DB_GROUP | DB_INSTANCE | PROPERTY           | VALUE  |
+-----+-----+-----+-----+
| dbGroup1 | instanceM1 | minCon            | 2      |
| dbGroup1 | instanceM1 | maxCon            | 4      |
| dbGroup1 | instanceM1 | testOnCreate       | false  |
| dbGroup1 | instanceM1 | testOnBorrow       | false  |
```

```
| dbGroup1 | instanceM1 | testOnReturn           | false |
| dbGroup1 | instanceM1 | testWhileIdle          | false |
| dbGroup1 | instanceM1 | connectionHeartbeatTimeout | 20   |
| dbGroup1 | instanceM1 | connectionTimeout        | 10000 |
| dbGroup1 | instanceM1 | heartbeatPeriodMillis    | 10000 |
| dbGroup1 | instanceM1 | idleTimeout             | 600000 |
| dbGroup1 | instanceM1 | evictorShutdownTimeoutMillis | 10000 |
| dbGroup1 | instanceM1 | timeBetweenEvictionRunsMillis | 30000 |
+-----+-----+-----+
12 rows in set (0.01 sec)
```

:

DB_GROUP	dbinstance	DB_GROUP
DB_INSTANCE	dbinstance	
PROPERTY		
VALUE		

2.1.3.52 show @@cap_client_found_rows

show @@cap_client_found_rows

cap_client_found_rows

```
mysql> show @@cap_client_found_rows;
+-----+
| @@cap_client_found_rows |
+-----+
| 0                      |
+-----+
1 row in set (0.02 sec)
```

:

0-1-

2.1.3.53 show @@general_log

show @@general_log

general

```
mysql> show @@general_log;
+-----+-----+
| NAME      | VALUE       |
+-----+-----+
| general_log | ON          |
| general_log_file | /tmp/dble-general/general/general.log |
+-----+-----+
2 rows in set (0.02 sec)
```

:

```
general_log/
general_log_filegeneral
```

2.1.3.54 show @@statistic;

show @@statistic;

sql statistic

```
mysql> show @@statistic;
+-----+-----+
| NAME            | VALUE  |
+-----+-----+
| statistic       | OFF    |
| statisticAnalysis | OFF   |
| associateTablesByEntryByUserTableSize | 1024  |
+-----+-----+
```

```
| frontendByBackendByEntryByUserTableSize | 1024 |
| tableByUserByEntryTableSize          | 1024 |
| samplingRate                      | 0    |
| sqlLogTableSize                   | 1024 |
| queueMonitor                      | monitoring |
+-----+-----+
6 rows in set (0.01 sec)
```

:

```
statisticsql
statisticAnalysisssqlusertablecondition
associateTablesByEntryByUserTableSizesql_statistic_by_associate_tables_by_entry_by_user
frontendByBackendByEntryByUserTableSizesql_statistic_by_frontend_by_backend_by_entry_by_user
tableByUserByEntryTableSizesql_statistic_by_table_by_user_by_entry
samplingRate0[0,100] %
sqlLogTableSizesql_log
queueMonitor
```

2.1.3.55 show @@load_data.fail;**show @@load_data.fail**

load data

```
show @@load_data.fail;
Empty set (0.01 sec)

if have error file may like
show @@load_data.fail;
+-----+
| error_load_data_file      |
+-----+
| ./temp/error/1-data-table-dn1.txt |
| ./temp/error/1-data-table-dn2.txt |
+-----+
2 rows in set (0.01 sec)
```

:

```
error_load_data_file:
```

2.1.3.56 show @@statistic_queue.usage;**show @@statistic_queue.usage;**

()

```
show @@statistic_queue.usage;
+-----+-----+
| TIME        | USAGE |
+-----+-----+
| 2021-05-31 16:33:30 | 0.00% |
| 2021-05-31 16:33:35 | 0.00% |
| 2021-05-31 16:33:40 | 0.00% |
+-----+-----+
3 rows in set (0.01 sec)
```

:

```
TIME
USAGE
```

2.1.4 switch

2.20.04.0

2.1.5 kill

2.1.5.1 kill @@connection

```
kill @@connection id1,id2,...;  
idx idshow @@connection
```

OK

2.1.5.2 kill @@xa_session;

```
kill @@xa_session id1,id2,...;  
idx session idshow @@session.xa  
sessionxasession  
OKsession
```

2.1.5.3 KILL @@DDL_LOCK where schema=? and table=?

```
KILL @@DDL_LOCK where schema=? and table=?;  
schematableddl 2.22 KILL @@DDL_LOCK
```

OK

2.1.5.4 kill @@load_data

```
kill @@load_data;
```

OK

2.1.5.6 kill @@cluster_renew_thread '?'

```
kill @@cluster_renew_thread ?'  
ucore(clusterMode=ucore)DblerenewThread  
OK
```

2.1.6 stop

2.1.6.1 stop @@heartbeat

stop @@heartbeat keys:dbGroup

keys:dbGroupkeydbGroup **key:dbGroupdbGroup\$0-n dbGroup\$0-2dbGroup[0],dbGroup[1],dbGroup[2]BUG**

value:

dbGroupkeyhostheartbeat n

OK

2.1.7 reload

2.1.7.1 reload @@config

reload @@config;

2.19.09.0()2.19.09.0reload @@config_all

2.1.7.2 reload @@config_all

reload @@config_all [-s] [-f] [-r];

user.xmldb.xmlsharding.xml

-s reloadreload

-f dbGroup-rdbGroup,

-r ,

[2.19 reload_all](#)

OK ERROR

metameta

-
-
- shardingNode
- shardingNodedbGroup/dbInstance
- schema
- schema
- schema shardingNode
- schemashardingNodedbGroup/dbInstance

-rmeta

-r-s,metadatadbGroup/dbInstance

,metadata #1002

shardingNodeschemaglobal

(systemouterHAFalse),,,, [2.12](#)

2.1.7.3 reload @@metadata

reload @@metadata;

OK

reload @@metadata where schema=? [and table=?]

schema

OK

reload @@metadata where table in ('schema1.table1','schema2.table2','schema1.table3',...)

schema1table1,table3schema2table2

OK

2.1.7.4 reload @@sqlslow=N;

reload @@sqlslow=N;

slow sqlN OK

2.1.7.5 reload @@user_stat()

reload @@user_stat;

3.23.08.0

2.1.7.6 reload @@query_cf

reload @@query_cf[=table&column];

tablecolumn

show @@sql.condition

OK

```
reload @@query_cf;
```

```
reload @@query_cf=NULL;
```

2.1.7.7 reload @@general_log_file=?

```
reload @@general_log_file = 'general/general.log';
```

```
general'/'homepath
```

```
OK
```

2.1.7.8 reload @@statistic_table_size = ? [where table='?' | where table in (dble_information.tableA,...)]

```
reload @@statistic_table_size = 90;
```

```
sql_statistic_by_frontend_by_backend_by_entry_by_usersql_statistic_by_table_by_user_by_entrysql_statistic_by_associate_tables_by_entry_by_user90  
OK
```

```
reload @@statistic_table_size = 90 where table = 'sql_statistic_by_table_by_user_by_entry'
```

```
sql_statistic_by_table_by_user_by_entry90
```

```
OK
```

```
reload @@statistic_table_size = 90 where table in(sql_statistic_by_table_by_user_by_entry,sql_statistic_by_associate_tables_by_entry_by_user)
```

```
sql_statistic_by_table_by_user_by_entrysql_statistic_by_associate_tables_by_entry_by_user90  
OK
```

```
reload @@statistic_table_size = 90 where table='sql_log'
```

```
sql_log90
```

```
OK
```

2.1.7.9 reload @@samplingRate = ?

```
0[0,100] %
```

2.1.7.10 reload @@load_data.num=N

```
reload @@load_data.num=N
```

```
NmaxRowSizeToFilesql
```

```
OK
```

2.1.7.11 reload @@xaIdCheck.period=N

```
reload @@xaIdCheck.period=N
```

```
N>0XA(s)N<=0,; N=6060sXA
```

```
OK
```

2.1.9 offline

offline;

dble, dblepingselect user

OK

2.1.10 online

online

dbleoffline

OK

2.1.13 dryrun

reloaddrayrun

sharding.xml reloaddrayrun sharding.xml:

```
<?xml version="1.0"?>
<dble:sharding xmlns:dble="http://dble.cloud/">
  <schema name="testdb" sqlMaxLimit="100" >
    <shardingTable name="sharding_two_node" shardingNode="dn1,dn2" shardingColumn="id" function="two-long" />
    <shardingTable name="sharding_two_node2" shardingNode="dn1,dn2" shardingColumn="id" function="two-long" />
    <shardingTable name="sharding_two_node3" shardingNode="dn1,dn2" shardingColumn="id" function="two-long" />
    <shardingTable name="sharding_four_node" shardingNode="dn1,dn2,dn3,dn4" shardingColumn="id" function="rule_simple" />
    <globalTable name="test_table" shardingNode="dn$1-2"/>
    <shardingTable name="a_test" shardingNode="dn1,dn2,dn3,dn4" shardingColumn="id" function="rule_simple" />
    <shardingTable name="a_order" shardingNode="dn1,dn2,dn3,dn4" shardingColumn="id" function="rule_simple" />
    <shardingTable name="test_shard" shardingNode="dn1,dn2,dn3,dn4" shardingColumn="id" function="rule_simple" />
    <globalTable name="test_global" shardingNode="dn1,dn2,dn3,dn4"/>
    <shardingTable name="sbtest1" shardingNode="dn1,dn2,dn3,dn4" shardingColumn="id" function="rule_simple" />
  </schema>
  <schema name="nosharding_test" sqlMaxLimit="100" shardingNode="dn5">
  </schema>
  <shardingNode name="dn1" dbGroup="dh1" database="ares_test" />
  <shardingNode name="dn2" dbGroup="dh2" database="dble_test" />
  <shardingNode name="dn3" dbGroup="dh1" database="dble_test" />
  <shardingNode name="dn4" dbGroup="dh2" database="dble_test" />
  <shardingNode name="dn5" dbGroup="dh1" database="nosharding" />
  <shardingNode name="dn8" dbGroup="dh1" database="xxxxooxxx" />

  <function name="rule_simple" class="Hash">
    <property name="partitionCount">4</property>
    <property name="partitionLength">1</property>
  </function>
</dble:sharding>
<function class="Hash" name="two-long">
  <property name="partitionCount">2</property>
  <property name="partitionLength">1</property>
</function>
```

dryrun

```
mysql> dryrun;
+-----+-----+
| TYPE | LEVEL   | DETAIL           |
+-----+-----+
| Xml  | WARNING | shardingNode dn9 is useless |
| Xml  | WARNING | shardingNode dn8 is useless |
+-----+-----+
2 rows in set (0.58 sec)
```

TYPE: XMLxmlBACKEND

LEVEL:WARNING ERROR,WARNING

DETAIL :

2.1.14 shardingNode

shardingNodedbGroupshardingNodeshardingNode

2.1.14.0

```
pausedblequeuewait_limitresume,  
pausepausetimeoutsqldblesql  
pausedble server pause shardingNode reloaddbledble  
reload
```

2.1.14.1

```
pause @@shardingNode = 'dn1,dn2' and timeout = 10 ,queue = 10,wait_limit = 10;  
:  
timeout:timeoutpause  
queue:  
wait_limit:wait_limit
```

2.1.14.2

```
RESUME; OK "No shardingNode paused"
```

2.1.14.3

```
show @@pause;
```

```
mysql> show @@pause;  
+-----+  
| PAUSE_SHARDING_NODE |  
+-----+  
| dn1 |  
| dn2 |  
+-----+  
2 rows in set (0.15 sec)
```

2.1.15

:

2.1.15.1

```
mysql> show @@slow_query_log;
+-----+
| @@slow_query_log |
+-----+
| 0             |
+-----+
1 row in set (0.00 sec)
```

2.1.15.2

```
mysql> enable @@slow_query_log;
Query OK, 1 row affected (0.09 sec)
enable slow_query_log success
```

2.1.15.3

```
mysql> disable @@slow_query_log;
Query OK, 1 row affected (0.03 sec)
disable slow_query_log success
```

2.1.15.4

```
mysql> show @@slow_query.time;
+-----+
| @@slow_query.time |
+-----+
| 100            |
+-----+
1 row in set (0.00 sec)
```

2.1.15.5

```
mysql> reload @@slow_query.time=200;
Query OK, 1 row affected (0.10 sec)
reload @@slow_query.time success
```

```
mysql> show @@slow_query.time;
+-----+
| @@slow_query.time |
+-----+
| 200            |
+-----+
1 row in set (0.00 sec)
```

2.1.15.6

```
mysql> show @@slow_query.flushperiod;
+-----+
| @@slow_query.flushperiod |
+-----+
| 1                |
+-----+
1 row in set (0.00 sec)
```

2.1.15.7

```
mysql> reload @@slow_query.flushperiod=2;
Query OK, 1 row affected (0.05 sec)
reload @@slow_query.flushPeriod success
```

```
mysql> show @@slow_query.flushperiod;
+-----+
| @@slow_query.flushperiod |
+-----+
```

```
| 2
+
1 row in set (0.00 sec)
```

2.1.15.8

```
mysql> show @@slow_query.flushsize;
+-----+
| @@slow_query.flushsize |
+-----+
| 1000
+
1 row in set (0.01 sec)
```

2.1.15.9

```
mysql> reload @@slow_query.flushsize=1100;
Query OK, 1 row affected (0.03 sec)
reload @@slow_query.flushSize success
```

```
mysql> show @@slow_query.flushsize;
+-----+
| @@slow_query.flushsize |
+-----+
| 1100
+
1 row in set (0.00 sec)
```

2.1.15.10slowQueueOverflowPolicy`bootstrap.cnf`

```
mysql> reload @@slow_query.queue_policy=1;
Query OK, 1 row affected (0.02 sec)
reload @@slow_query.queue_policy success
```

```
mysql> select * from dble_variables where variable_name = 'slowQueueOverflowPolicy';
+-----+-----+-----+-----+-----+
| variable_name | variable_value | comment | read_only |
+-----+-----+-----+-----+
| slowQueueOverflowPolicy | 1 | Slow log queue overflow policy, the default is 2 | false |
+-----+-----+-----+-----+
1 row in set (0.01 sec)
```

2.1.15.11

show @@connection.sql.status where FRONT_ID= ?; query trace queryquery

```
mysql> show @@connection.sql.status where FRONT_ID= 1;
+-----+-----+-----+-----+-----+
| OPERATION | START(ms) | END(ms) | DURATION(ms) | SHARDING_NODE | SQL/REF
+-----+-----+-----+-----+-----+
| Read_SQL | 0.0 | 0.082598 | 0.082598 | - | -
| Parse_SQL | 0.082598 | 0.676424 | 0.593826 | - | -
| Route_Calculation | 0.676424 | 0.895382 | 0.218958 | - | -
| Prepare_to_Push/Optimize | 0.895382 | 6743.838628 | 6742.943246 | - | -
| Execute_SQL | 6743.838628 | 6753.488422 | 9.649794 | dn1 | select * from sharding_4_t1 |
| Execute_SQL | 6743.838628 | 6751.472835 | 7.634207 | dn3 | select * from sharding_4_t1 |
| Execute_SQL | 6743.838628 | 6750.981646 | 7.143018 | dn4 | select * from sharding_4_t1 |
| Execute_SQL | 6743.838628 | 6753.31394 | 9.475312 | dn2 | select * from sharding_4_t1 |
| Fetch_result | 6753.488422 | 6754.383316 | 0.894894 | dn1 | select * from sharding_4_t1 |
| Fetch_result | 6751.472835 | 6751.656604 | 0.183769 | dn3 | select * from sharding_4_t1 |
| Fetch_result | 6750.981646 | 6751.188385 | 0.206739 | dn4 | select * from sharding_4_t1 |
| Fetch_result | 6753.31394 | 6754.286055 | 0.972115 | dn2 | select * from sharding_4_t1 |
| Write_to_Client | 6750.981646 | unfinished | unknown | - | -
+-----+-----+-----+-----+-----+
13 rows in set (0.04 sec)
```

join

```
mysql> show @@connection.sql.status where FRONT_ID= 1;
+-----+-----+-----+-----+-----+
| OPERATION | START(ms) | END(ms) | DURATION(ms) | SHARDING_NODE | SQL/REF
+-----+-----+-----+-----+-----+
```

+-----+-----+-----+-----+-----+					
Read_SQL 0.0 0.039588 0.039588 - -					
Parse_SQL 0.039588 0.756578 0.71699 - -					
Route_Calculation 0.756578 1.5547 0.798122 - -					
Prepare_to_Push/Optimize 1.5547 3.428551 1.873851 - -					
Execute_SQL 3.428551 2362.10579 2358.677239 dn1_0 select `a`.`age`, `a`.`id`, `a`.`name` from `sharding_4_t1` `a` ORDER BY `a`.`id` ASC					
Fetch_result 2362.10579 unfinished unknown dn1_0 select `a`.`age`, `a`.`id`, `a`.`name` from `sharding_4_t1` `a` ORDER BY `a`.`id` ASC					
Execute_SQL 3.428551 2362.122407 2358.693856 dn2_0 select `a`.`age`, `a`.`id`, `a`.`name` from `sharding_4_t1` `a` ORDER BY `a`.`id` ASC					
Fetch_result 2362.122407 unfinished unknown dn2_0 select `a`.`age`, `a`.`id`, `a`.`name` from `sharding_4_t1` `a` ORDER BY `a`.`id` ASC					
Execute_SQL 3.428551 2362.307153 2358.878602 dn3_0 select `a`.`age`, `a`.`id`, `a`.`name` from `sharding_4_t1` `a` ORDER BY `a`.`id` ASC					
Fetch_result 2362.307153 unfinished unknown dn3_0 select `a`.`age`, `a`.`id`, `a`.`name` from `sharding_4_t1` `a` ORDER BY `a`.`id` ASC					
Execute_SQL 3.428551 2364.523615 2361.095064 dn4_0 select `a`.`age`, `a`.`id`, `a`.`name` from `sharding_4_t1` `a` ORDER BY `a`.`id` ASC					
Fetch_result 2364.523615 unfinished unknown dn4_0 select `a`.`age`, `a`.`id`, `a`.`name` from `sharding_4_t1` `a` ORDER BY `a`.`id` ASC					
MERGE_AND_ORDER 2362.639012 unfinished unknown merge_and_order_1 dn1_0; dn2_0; dn3_0; dn4_0					
SHUFFLE_FIELD 4178.383366 unfinished unknown shuffle_field_1 merge_and_order_1					
Execute_SQL 3.428551 2365.71371 2362.285159 dn1_1 select `b`.`id` from `sharding_2_t1` `b` ORDER BY `b`.`id` ASC					
Fetch_result 2365.71371 unfinished unknown dn1_1 select `b`.`id` from `sharding_2_t1` `b` ORDER BY `b`.`id` ASC					
Execute_SQL 3.428551 2365.952707 2362.524156 dn2_1 select `b`.`id` from `sharding_2_t1` `b` ORDER BY `b`.`id` ASC					
Fetch_result 2365.952707 unfinished unknown dn2_1 select `b`.`id` from `sharding_2_t1` `b` ORDER BY `b`.`id` ASC					
MERGE_AND_ORDER 2366.164823 unfinished unknown merge_and_order_2 dn1_1; dn2_1					
SHUFFLE_FIELD not started unfinished unknown - -					
JOIN not started unfinished unknown - -					
SHUFFLE_FIELD not started unfinished unknown - -					
Write_to_Client not started unfinished unknown - -					
+-----+-----+-----+-----+-----+					

23 rows in set (0.04 sec)

2.1.16 /

2.1.16.1

dbleshardingNode

```
create database @@shardingNode ='dn.....'  
shardingNode dn$1-4  
shardingNodeshardingNodeshardingNode $Name does not exists.  
shardingNode create database if not exists $databaseNameOK
```

2.1.16.2

shardingNode

```
drop database @@shardingNode ='dn.....'  
shardingNode dn$1-4  
shardingNodeshardingNode $Name does not exists.  
shardingNode drop database if exists $databaseNameOKshow @@shardingNodeSCHEMA_EXISTSfalse
```

check

2.1.17.0 check @@metadata

meta

- `check @@metadata`
 1. `reload @@metadata datatime`
 2. `reload @@config_alldatatetime`
 3. `metadatatetime`
- `check full @@metadata ,:`
 - `where schema=? and table=?`
 - `where schema=?`
 - `where reload_time='yyyy-MM-dd HH:mm:ss' , where reload_time>='yyyy-MM-dd HH:mm:ss' , where reload_time<='yyyy-MM-dd HH:mm:ss'`
 - `where reload_time is null`
 - `where consistent_in_sharding_nodes=0`
 - `where consistent_in_sharding_nodes = 1`
 - `where consistent_in_memory=0`
 - `where consistent_in_memory = 1`
 - If no where, retrun all results.
- `check full @@metadata :`

schema	table	reload_time	table_structure	consistent_in_sharding_nodes	consistent_in_memory
schema	table	2018-09-18 11:01:04	CREATE TABLE table`(...)	1	1

```
column table_structure show create table
column consistent_in_sharding_nodes 01
column consistent_in_memory meta01

table_structurenullconsistent_in_sharding_nodesconsistent_in_memory
consistent_in_sharding_nodes0consistent_in_memory
```

2.1.17.1 check @@global schema = '' [and table = '']

```
mysql> check @@global schema = 'testdb';
+-----+-----+-----+
| SCHEMA | TABLE      | DISTINCT_CONSISTENCY_NUMBER | ERROR_NODE_NUMBER |
+-----+-----+-----+
| testdb | tb_global1 |          0 |          0 |
+-----+-----+-----+
```

SCHEMA: SCHEMA

TABLE: TABLE

DISTINCT_CONSISTENCY_NUMBER

ERROR_NODE_NUMBER SQL

SQLDISTINCT_CONSISTENCY_NUMBER1

2.1.18 release

2.1.18.1 release @@reload_metadata

reload_metadata reload/reload config_all/reload metadata reload metadata
hang reload metadata db OK ERROR

- configtable metareload @@metadatameta
- reload reload 5999 SQLCODE “meta”
- dblereload [show @@reload_status](#)

2.1.19 split

POCdblesqldble 2.19.09.0mysqldump

dump

1. create database
2. ddldumpbigint
3. insertdbledump
4. ddldump
- 5.
- 6.

```
mysql > split src dest [-sschema] [-r500] [-w512] [-l10000] [--ignore] [-t2]

- srcdump
- destdump
- -sdumpschemaschemadumpschemaschemadump           -sschema          -sschema          -sschema

- -r500
- -w5122
- -lsplitinsertvalues,4000
- --ignoreinsert
- -tinsert

[ ]
```

-shardingNode-.dump

dump /tmp/mysql_dump.sql /tmp/dump/

split /tmp/mysql_dump.sql /tmp/dump/

splitdble.logslog4j.xml

```
<Configuration status="WARN">
  <Appenders>
    <!-- dblelog4j.xmlAppenders -->
    <RollingFile name="DumpFileLog" fileName="logs/dump.log"
      filePattern="logs/${date:yyyy-MM}/dump-%d{MM-dd}-%i.log.gz">
      <PatternLayout>
        <Pattern>%d{yyyy-MM-dd HH:mm:ss.SSS} %5p [%t] (%l) - %m%n</Pattern>
      </PatternLayout>
    <Policies>
      <OnStartupTriggeringPolicy/>
      <SizeBasedTriggeringPolicy size="250 MB"/>
      <TimeBasedTriggeringPolicy/>
    </Policies>
    <DefaultRolloverStrategy max="10"/>
  </RollingFile>
  </Appenders>
  <Loggers>
    <!-- dblelog4j.xmlLoggersleveldebug -->
    <Logger name="dumpFileLog" level="info" additivity="false" includeLocation="false" >
      <AppenderRef ref="DumpFileLog" />
      <AppenderRef ref="RollingFile"/>
    </Logger>
  </Loggers>
</Configuration>
```

“dump file has been read d%”

debug

dump file idletimeout kill @@connection id dump file

- 1.
- 2.
3. dump

2.1.20 flow_control

2.1.20.1

```
mysql> flow_control @@show;
+-----+-----+-----+
| FLOW_CONTROL_TYPE | FLOW_CONTROL_HIGH_LEVEL | FLOW_CONTROL_LOW_LEVEL |
+-----+-----+-----+
| FRONT_END          |        4194304 |       262144 |
| dbGroup1-hostM1    |        4194304 |       262144 |
| dbGroup2-hostM2    |        4194304 |       262144 |
+-----+-----+-----+
1 row in set (0.00 sec)
```

- FLOW_CONTROL_TYPE “FRONT-END”;-
- FLOW_CONTROL_HIGH_LEVEL
- FLOW_CONTROL_LOW_LEVEL

2.1.20.2

flow_control @@set [enableFlowControl = true/false] [flowControlHighLevel = ?] [flowControlLowLevel = ?]

```
MySQL [(none)]> flow_control @@set enableFlowControl = true flowControlHighLevel= 100000 flowControlLowLevel = 30000;
Query OK, 0 rows affected (0.02 sec)
```

`bootstrap.dynamic.cnf`

- enableFlowControl bootstrap.cnfenableFlowControl
- flowControlHighLevelbootstrap.cnfflowControlHighLevel
- flowControlLowLevelbootstrap.cnfflowControlLowLevel

2.1.20.3

```
MySQL [(none)]> flow_control @@list;
+-----+-----+-----+-----+-----+-----+-----+
| CONNECTION_TYPE | CONNECTION_ID | CONNECTION_INFO | WRITING_QUEUE_BYTES | READING_QUEUE_BYTES | FLOW_CONTROLLED |
+-----+-----+-----+-----+-----+-----+
| ServerConnection | 1 | 127.0.0.1:50817/schema1 user = root | 464594 | NULL | false |
| MySQLConnection | 8 | 10.186.65.86:3307/db2 mysqlId = 1287 | 0 | 0 | false |
| MySQLConnection | 12 | 10.186.65.86:3308/db1 mysqlId = 1557 | 0 | 0 | false |
| MySQLConnection | 6 | 10.186.65.86:3307/db1 mysqlId = 1285 | 0 | 86172 | false |
| MySQLConnection | 15 | 10.186.65.86:3308/db2 mysqlId = 1559 | 0 | 0 | false |
+-----+-----+-----+-----+-----+-----+
```

- CONNECTION_TYPE MySQLConnection/ServerConnection
- CONNECTION_ID dbleIDID
- CONNECTION_INFO IPMySQLID
- WRITING_QUEUE_BYTES
- READING_QUEUE_BYTES null
- FLOW_CONTROLLED

`dble_information.dble_flow_control`

2.1.21

2.1.21.1 &

mysql/dble

2.1.21.2

fresh conn [forced] where dbGroup ='groupName' [and dbInstance='instanceName'];

- forced
- forced
- dbInstancedbGroupdbInstance
- dbInstancedbInstancedbGroupdbInstance

-
-
- - `cluster @@detach`
 - `cluster @@attach`
- -
 -
 -
-

dble

2.1.22.1

`dble zookeeper/ucore``/``<3.21.10 , dble dble`

2.1.22.2

`≥3.21.10dble dble``dble dble (2.1.22.4) reload @@config`

2.1.22.3

cluster @@detach [timeout=10]

-
- (2.1.22.4)"cluster is detached"
- timeout 10s

cluster @@attach [timeout=10]

-
- timeout 10s

2.1.22.4

2.1.22.4.1

- 1.
- 2.
- 3.

`(9066)``(9066)``(9066) (9066) (9066) timeout`

2.1.22.4.2

`"cluster is detached"`

2.1.22.4.3

`dble dble``A,B,C A B t1reloadCB t1A reload t1 A B AA reload reload B`

2.1.22.5

- DDL
- reload @@config
- show @@binlog.status
- view
-
-
- xa commit/rollback
- "offset-step" table

2.2

dble cluster.cnf

```
sequenceHandlerType=n
```

sequenceHandlerType

- 1 MySQL offset-step
- 2
- 3
- 4 offset-step

```
/*id*/  
insert into table1(name) values('test');
```

2.2.1 MySQL offset-step

MySQL offset-step

1. 24
2. SELECT dble_seq_nextval('seqName'); **seqName increment**[current_value, current_value+increment)
3. 2
- 4.

[1.7.1 offset-step](#)

2.2.2

dbleID

bigint63(63Java0)

63bits

a.29bits	b.10bits	c.12bits	d.12bits
----------	----------	----------	----------

- a - e
- a4129
- b10instance idbootstrap.cnfinstanceId
- c12
- d4112

1. bootstrap.cnfinstanceId1023
2. 40954095
3. java,411288834974657L(2010)
4. 4169

2.2.3

Zookeeper(ID63ID
PS:63Java0

2.2.3.1

63bits

a.9bits	b.9bits	c.6bits	d.39bits
---------	---------	---------	----------

:

- a - e
- aid9
- b9 id(bootstrap.cnfinstanceIdzookeeper, [1.7.3 time](#))
- c6
- d39(17)

2.2.3.2

cluster.cnfsequenceInstanceByZktrue, bootstrap.cnfinstanceId([2.2.2](#))

2.2.3.3

cluster.cnfsequenceInstanceByZktruezookeeper,zk, % 32 INSTANCEID.

2.2.4 offset-step

offset-stepzookeeper

1. (`schemaX`.`tableX`)
2. zookeepermin
3. ([1.7.4 offset-step](#)),max
4. max+1zookeepermin
- 5.

2.3

3.20.10.0dble3.20.10.0

2.3.1

2.3.1.1

dble user.xml rwSplitUserdbGroupdbGroupdb.xmluser.xmluser.xml

```
<dble:user xmlns:dble="http://dble.cloud/" version="4.0">
  <managerUser name="man1" password="654321" maxCon="100"/>
  <shardingUser name="root" password="123456" schemas="testdb" readOnly="false" maxCon="20"/>
  <rwSplitUser name="rwsu1" password="123456" dbGroup="rwGroup" maxCon="20"/>
</dble:user>
```

1. user.xmlshardingUserdblesharding.xml(dble)sharding.xml
2. dbledbGroupdbGrouprwSplitUserdbGroupdb.xmlshardingUserdbGroupschemassharding.xmlshardingNode
3. rwSplitUserdbGroup
4. dbGroupinstancedbGroupinstance

2.3.1.2

db.xmlsharding.xmldb.xmlsharding.xml

2.3.2

dbledbInstancerwSplitMode0db.xml

1. dbInstance
- 2.

2.3.2.1 dbInstance

dbInstancesdbInstancedbInstanceshow slave statusdbledelayThresholddbInstancesdelayThreshold=-1

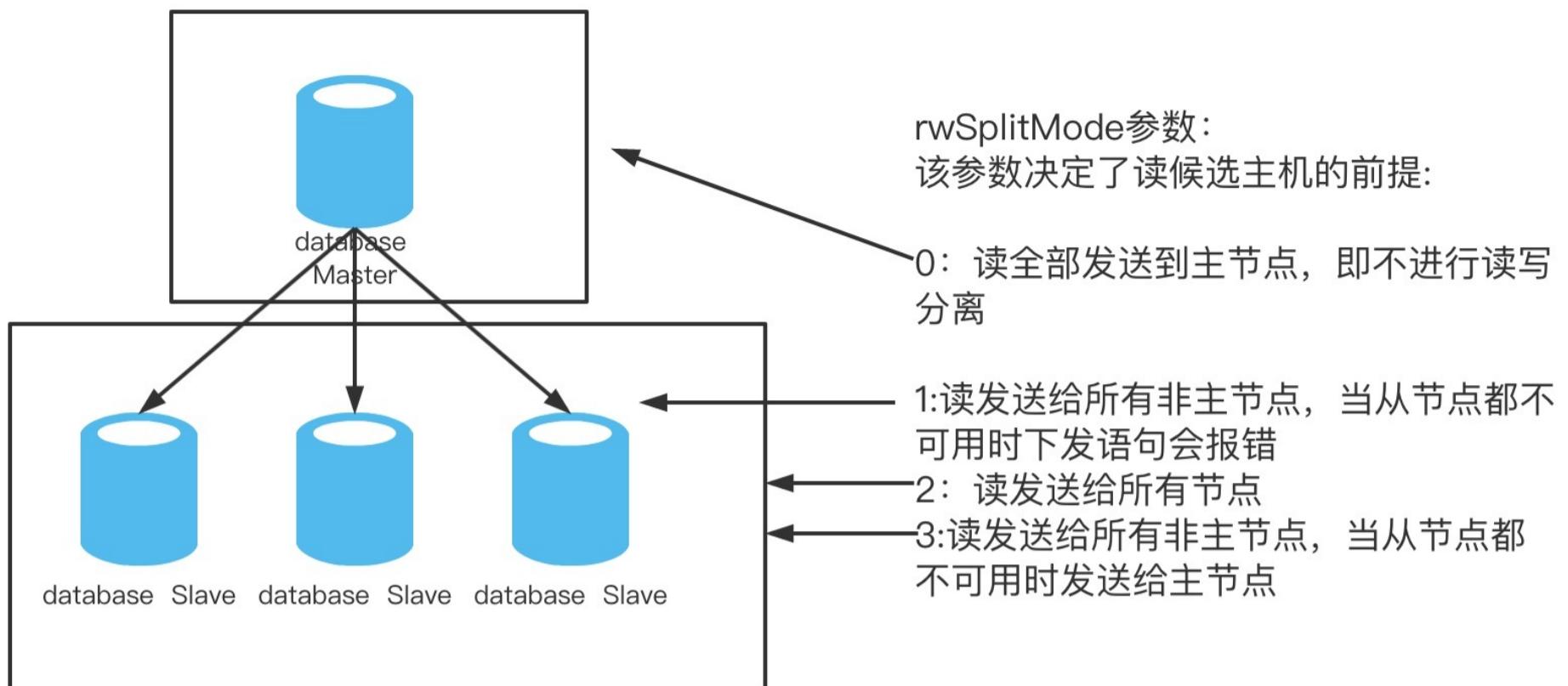
- (primary="true")
 - rwSplitMod2dbInstances
 - (primary primary="false")
 - dbInstances
 - dbInstances
- -

2.3.2.2

dbInstancedbInstance

- dbInstance
- dbInstance
 - dbInstance(readWeight), ,
 - dbInstance,

2.3.2.3 dbGrouprwSplitMode



2.3.3

2.3.3.1

1. ddl
2. dml
3. prepared statement
- 4.

2.3.3.2

1. SQL select show

2.3.4

1. druid - set
2. druid - set session transaction read write, isolation level repeatable read
3. >= dble 3.21.06.x
4. set transaction read write
5. select
6. select ... into load datadble
7. mysqlnulldble
8. set hint
- 9.
10. ,
11. allowMultiQueries=true (false) jdbc multi-queries , dble MySQL Command-Line client

2.3.5

[rwStickyTime](#)

, , ,

SQLSQLrwStickyTimeSQL().
Hint SQL

db.xmlrwSplitMode

rwStickyTime=10001000ms

Step	Time Line	SQL	InstanceDB of backend	
0	50ms	Hint_SQL_1(*master*/ sql)	master	timeA
1	100ms	SQL_1	master	timeA=100ms
2	500ms	SQL_2	master	rwStickyTime>0(500ms-timeA)<=rwStickyTimeSQL
3	600ms	Hint_SQL_2(*slave*/ sql)	slave	
4	900ms	SQL_3	master	rwStickyTime>0(900ms-timeA)<=rwStickyTimeSQL
5	2000ms	SQL_4	slave	(rwStickyTime>0&&(2000ms-timeA)<=rwStickyTime)

SQLSQL select... show ... SQLSQL.

2.3.6

dbleinstanceinstance

2.3.6.1

dblebootstrap.cnfdb.xml

bootstrap.cnf

```
-Ddistrict=district1
-DdataCenter=dataCenterA
```

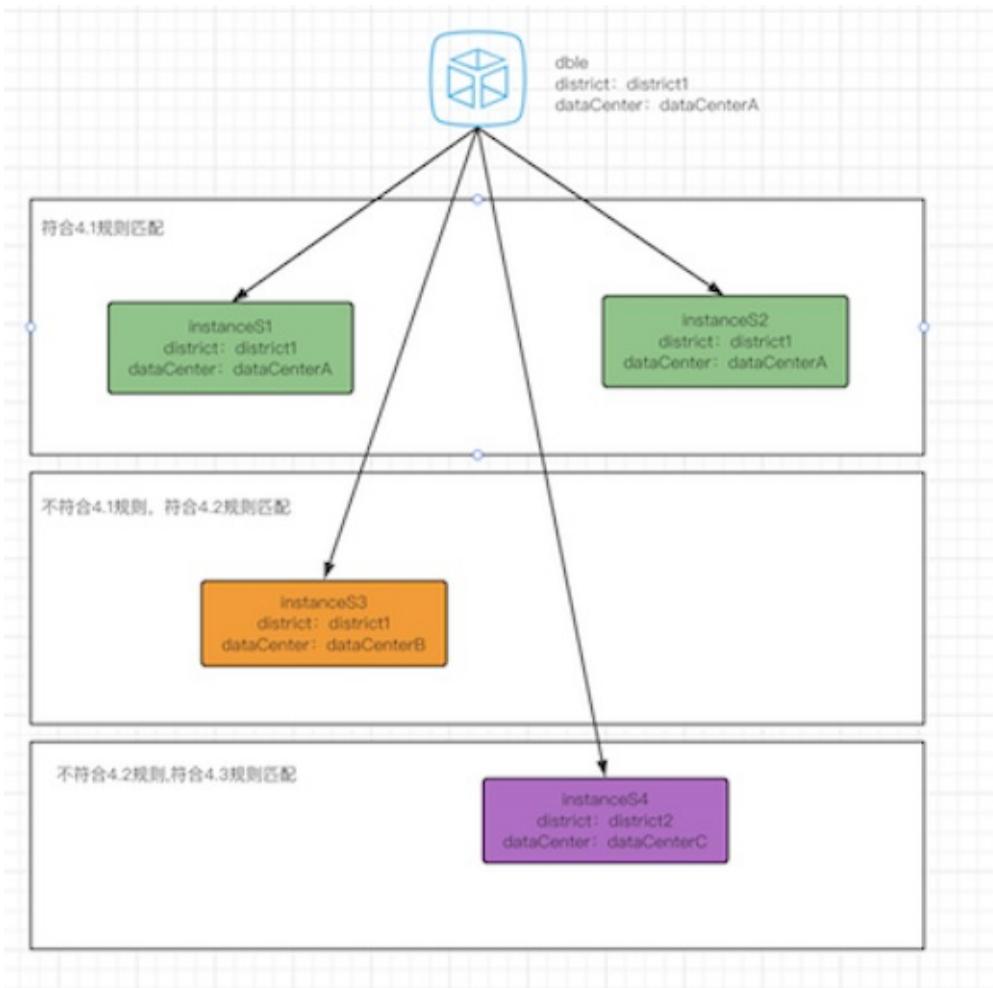
db.xml

```
<?xml version="1.0"?>
<dble:db xmlns:dble="http://dbe.cloud/">

  <dbGroup name="dbGroup1" rwSplitMode="1" delayThreshold="10000">
    <heartbeat errorRetryCount="1" timeout="10" keepAlive="60" >show slave status</heartbeat>
    <dbInstance name="instanceM1" url="ip4:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" dbDistrict="district1"
      dbDataCenter="dataCenterA" primary="true">
      </dbInstance>
      <!-- can have multi read instances -->
      <dbInstance name="instanceS1" url="ip5:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" dbDistrict="district1"
        dbDataCenter="dataCenterA" primary="false">
        </dbInstance>
        <dbInstance name="instanceS2" url="ip6:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" dbDistrict="district1"
          dbDataCenter="dataCenterA" primary="false">
          </dbInstance>
          <dbInstance name="instanceS3" url="ip7:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" dbDistrict="district
            1" dbDataCenter="dataCenterB" primary="false">
            </dbInstance>
            <dbInstance name="instanceS4" url="ip8:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" dbDistrict="district2"
              dbDataCenter="dataCenterC" primary="false">
              </dbInstance>
            </dbGroup>
          </dble:db>
```

1. select
2. rwSplitMode
3. bootstrap.cnf district db instance dbDistrict
4.
 - 4.1 district dataCenter instance
 - 4.2 4.14.1 instance district instance
 - 4.3 4.24.2 instance instance
5. hint hint

dbledbGroup1select



2.4 /Hint

Hint, :SQLSQL“”

-
- dbleinsert...select...

SQLSQLSQLSQLSQLSQLSQL

2.4.1 Hint

Hint

1. /*!dbe:type=....*/
2. /*#dbe:type=...*/
3. /* */()

```
/*#dbe: */" for mybatis and /*!dbe: */" for mysql
```

Hint

type4shardingnodedb_typesql_db_instance_url

2.4.2 shardingnode

1.
shardingnode=node
node,(node1.5 sharding.xml)
- 2.

2.4.3 db_type

1.
db_type=masterdb_type=slave
- 2.
3.
delete, insert, replace, update, ddldb_type=slave

2.4.4 sql

1.
sql=sql_statement
2.
sql_statementsql

2.4.5 db_instance_url

1.
db_instance_url=ip:port
2.
mysql
3.
delete, insert, replace, update, ddlsqlread_only

2.4.6

- dbleMySQL, MySQL #1169
- selectSQLdelete/update/insert delete/update/insert SQL
- SQL
- hintDDLreload @@metadata
- hintsession
- SQLSQL select id from tab_a where id='10000'
- / xxx /(sql)uproxyslavedblemaster

2.5

- [2.5.1 XA](#)
- [2.5.2 XA](#)
- [2.5.3 XA](#)
- [2.5.4 XA](#)
- [2.5.5](#)
- [2.5.6 XA](#)

2.5.1 XA

2.5.1.1 XA

2 DbleMysqlXAMySQL5.7XAMySQL 5.7dbleXA

1. set autocommit=0;
2. XA set xa=on;
3. SQL
4. commit/rollback;

SQL dble SQL 100

JDBCXAdemo
()

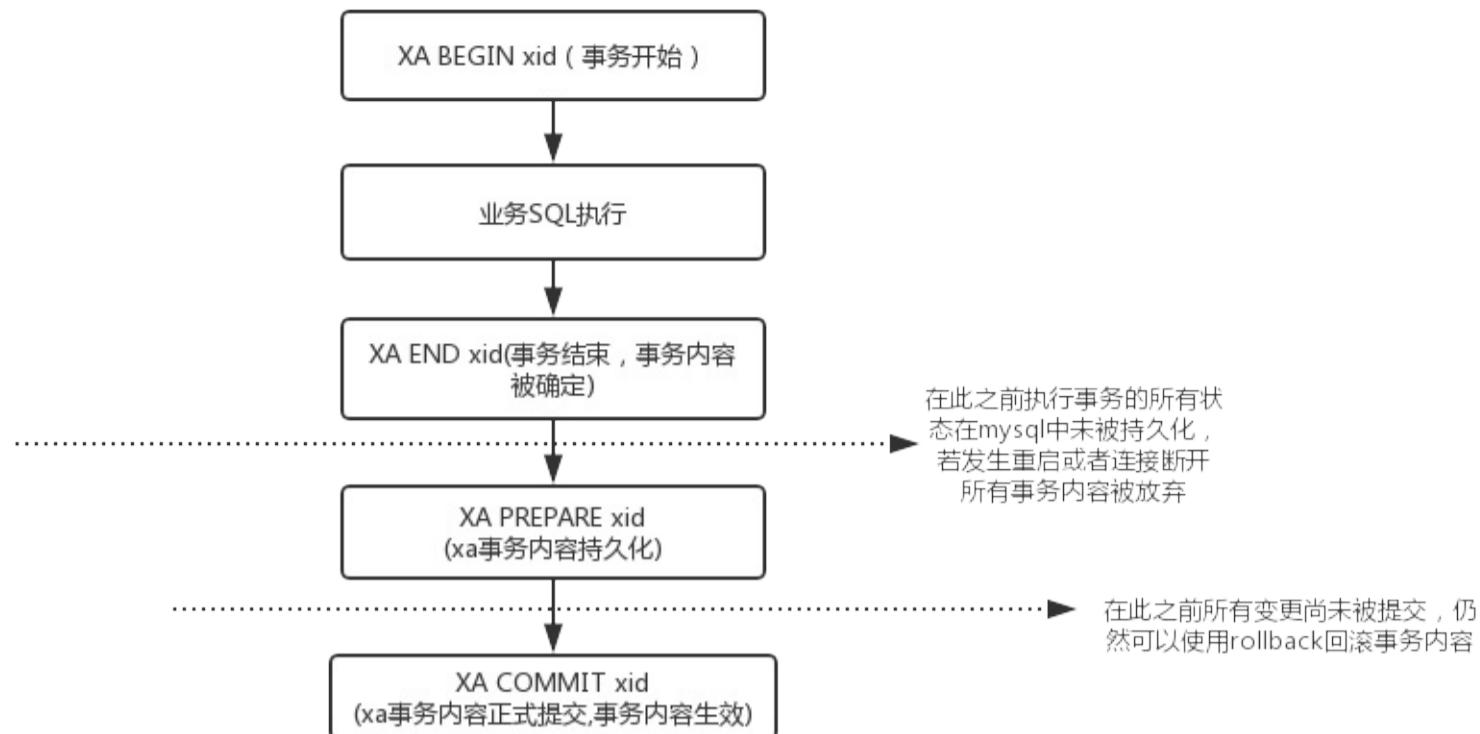
```
public class XaDemo {

    public static final String URL = "jdbc:mysql://localhost:8066/testdb";
                                    //jdbc:mysql://127.0.0.1:8066?sessionVariables=xa=1
                                    //set xa = 1
    public static final String USER = "root";
    public static final String PASSWORD = "123456";

    public static void main(String[] args){
        try {
            //1.
            Class.forName("com.mysql.jdbc.Driver");
            //2.
            Connection conn = DriverManager.getConnection(URL, USER, PASSWORD);
            //3.
            Statement stmt = conn.createStatement();
            stmt.execute("set xa = 1");
            //xa
            stmt.execute("begin");
            try {
                //catch
                //rollback
                stmt.execute("insert into xa_test set id = 11,name = '3333'");
                stmt.execute("insert into xa_test set id = 22,name = '333'");
                stmt.execute("insert into xa_test set id = 3,name = '33'");
                //
                stmt.execute("commit");
            }catch (Exception e){
                System.out.println(" error "+e);
                //
                stmt.execute("rollback");
            }finally {
                stmt.close();
                conn.close();
            }
        }
        }catch(Exception e){
            }
    }
}
```

2.5.1.2 XA

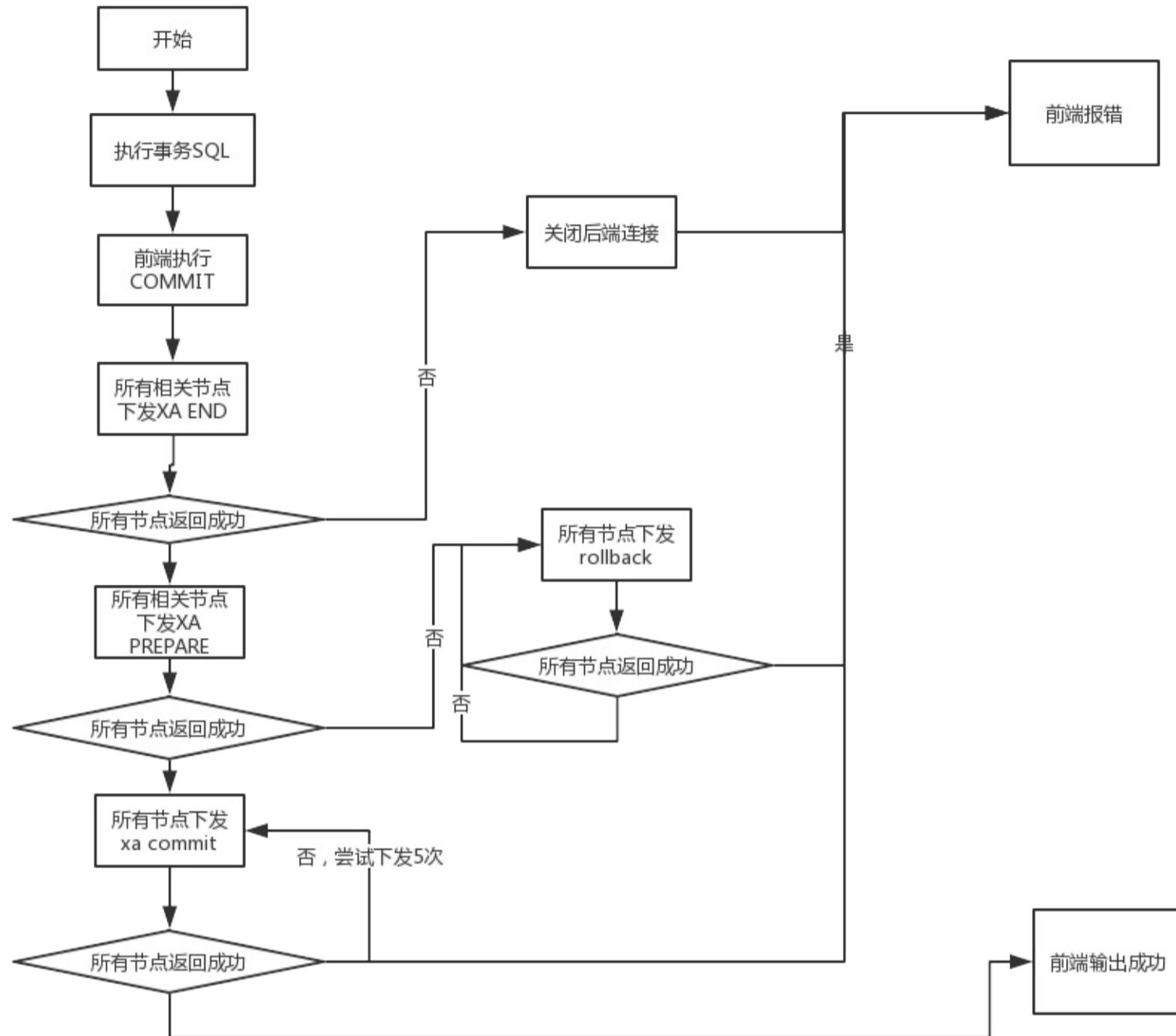
xamysql5.7xa



2.5.2 XA

2.5.2.1 XA

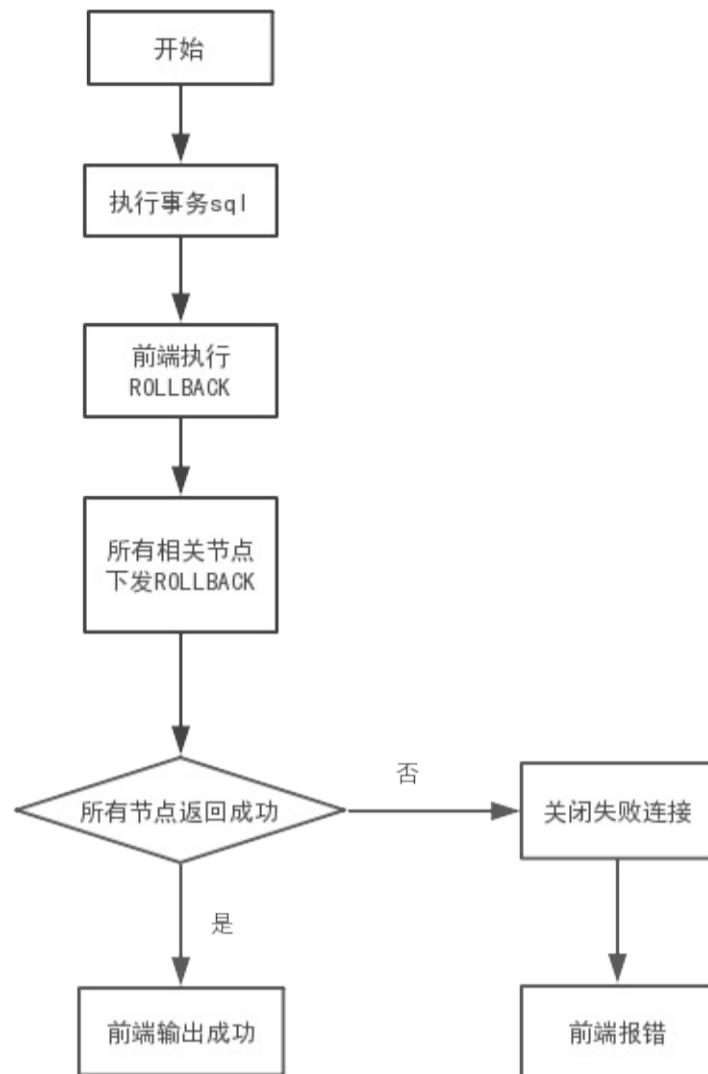
DbleXA



1. XAEND PREPARE COMMIT
2. PREPARE
3. PREPAREROLLBACK
4. COMMIT

2.5.2.2 XA

rollback



2.5.2.3 XA

2.19.03.0dble2.19.03.0

2.5.2.3.1

2.19.03.0bootstrap.cnf xaRetryCount

1. xaRetryCount 0
2. xaRetryCount 0xaRetryCount

2.5.2.3.2

2.19.03.0

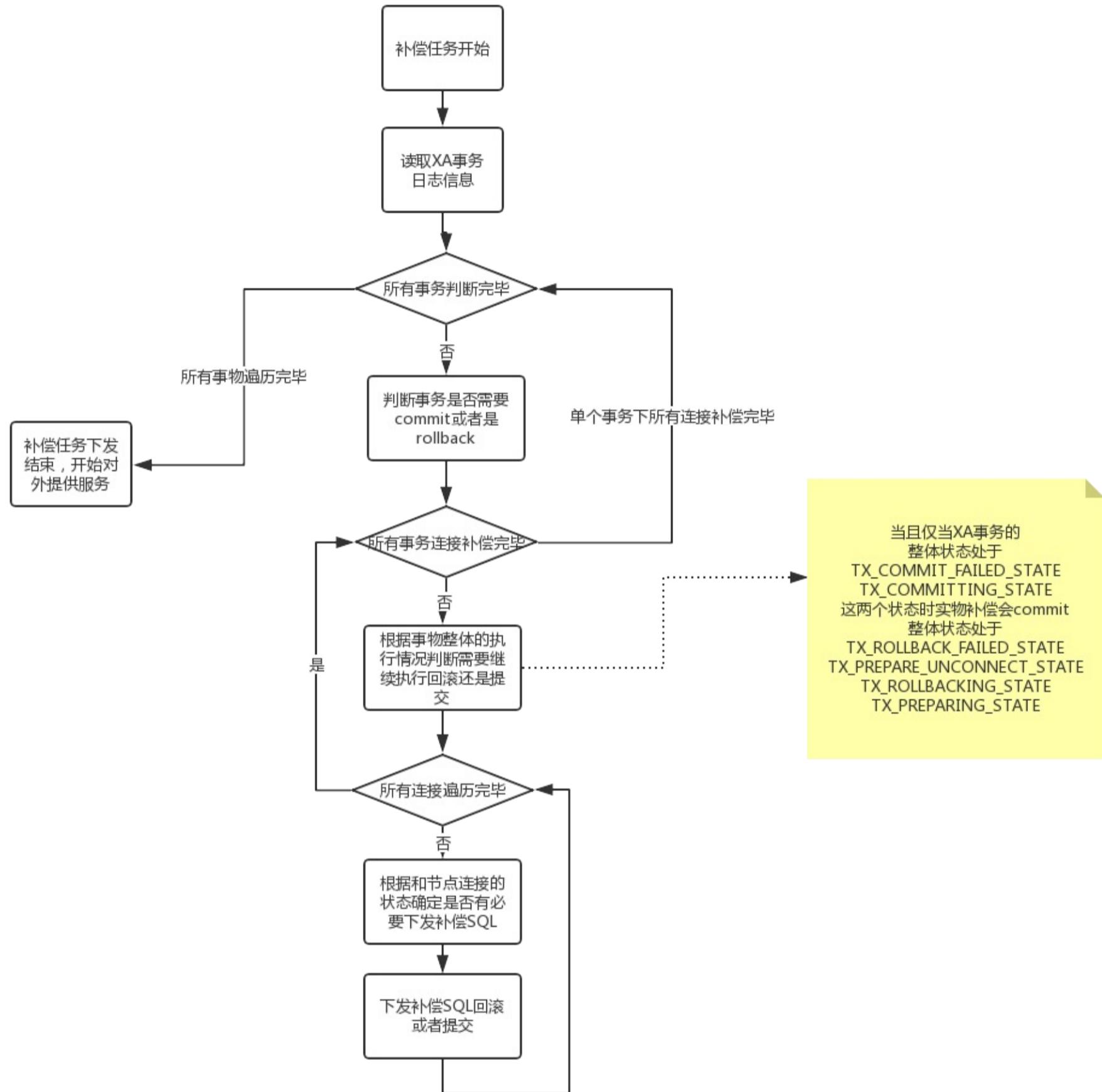
1. show @@session.xa xa
2. kill @@xa_session id1,id2... sessionxa

2.5.2.3.3

2.5.3 XA

2.5.3.1 XA

XA dbleXA dbleXAXA



XASQLdbe

2.5.3.2 XAxalogClean

xa.bootstrap.cnf xaLogCleanPeriod

2.5.3.3 XAxasectionCheck

dblexecutor(commit,XApreparecommit) rollback xaprepare

2.5.4 XA

2.5.4.1 XA

DbleXADBLEXA

```

1. ID
2.
3. host
4.
5.
6. ()
7.

```

```
{
  "id": "'Dble_Server.1.15'",
  "state": "8",
  "participants": [
    {
      "host": "10.186.24.37",
      "port": "3308",
      "p_state": "8",
      "expires": 0,
      "schema": "db3",
      "tableName": "testdb.test1",
      "repeatTableIndex": 0
    },
    {
      "host": "10.186.24.37",
      "port": "3306",
      "p_state": "8",
      "expires": 0,
      "schema": "db2",
      "tableName": "testdb.test2",
      "repeatTableIndex": 0
    },
    {
      "host": "10.186.24.37",
      "port": "3308",
      "p_state": "8",
      "expires": 0,
      "schema": "db2",
      "tableName": "testdb.test3",
      "repeatTableIndex": 0
    },
    {
      "host": "10.186.24.37",
      "port": "3306",
      "p_state": "8",
      "expires": 0,
      "schema": "db1",
      "tableName": "testdb.test4",
      "repeatTableIndex": 0
    }
  ]
}
```

2.5.4.2 XAstatus

status		
0	TX_INITIALIZE_STATE	XA
1	TX_STARTED_STATE	XA XA
2	TX_ENDED_STATE	XA END
3	TX_PREPARED_STATE	XA PREPARED

4	TX_PREPARE_UNCONNECT_STATE	XA PREPARED
5	TX_COMMIT_FAILED_STATE	XA COMMIT
6	TX_ROLLBACK_FAILED_STATE	XA ROLLBACK
7	TX_CONN_QUIT	mysql
8	TX_COMMITED_STATE	XA
9	TX_ROLLBACKED_STATE	XA
10	TX_COMMITTING_STATE	XA
11	TX_ROLLBACKING_STATE	XA
12	TX_PREPARING_STATE	XA prepare

2.5.4.3 XA

xa

bootstrap.cnf{xaRecoveryLogBaseDir}/{XaRecoveryLogBaseName}.log./xalog/xalog-1.log

Dble

ZK

ZKDbleZKXAZK

XAdble/{clusterId}/XALOG/{myid} Key

2.5.4.4

1ShardingRwSplit

2()begin

3Modifysql

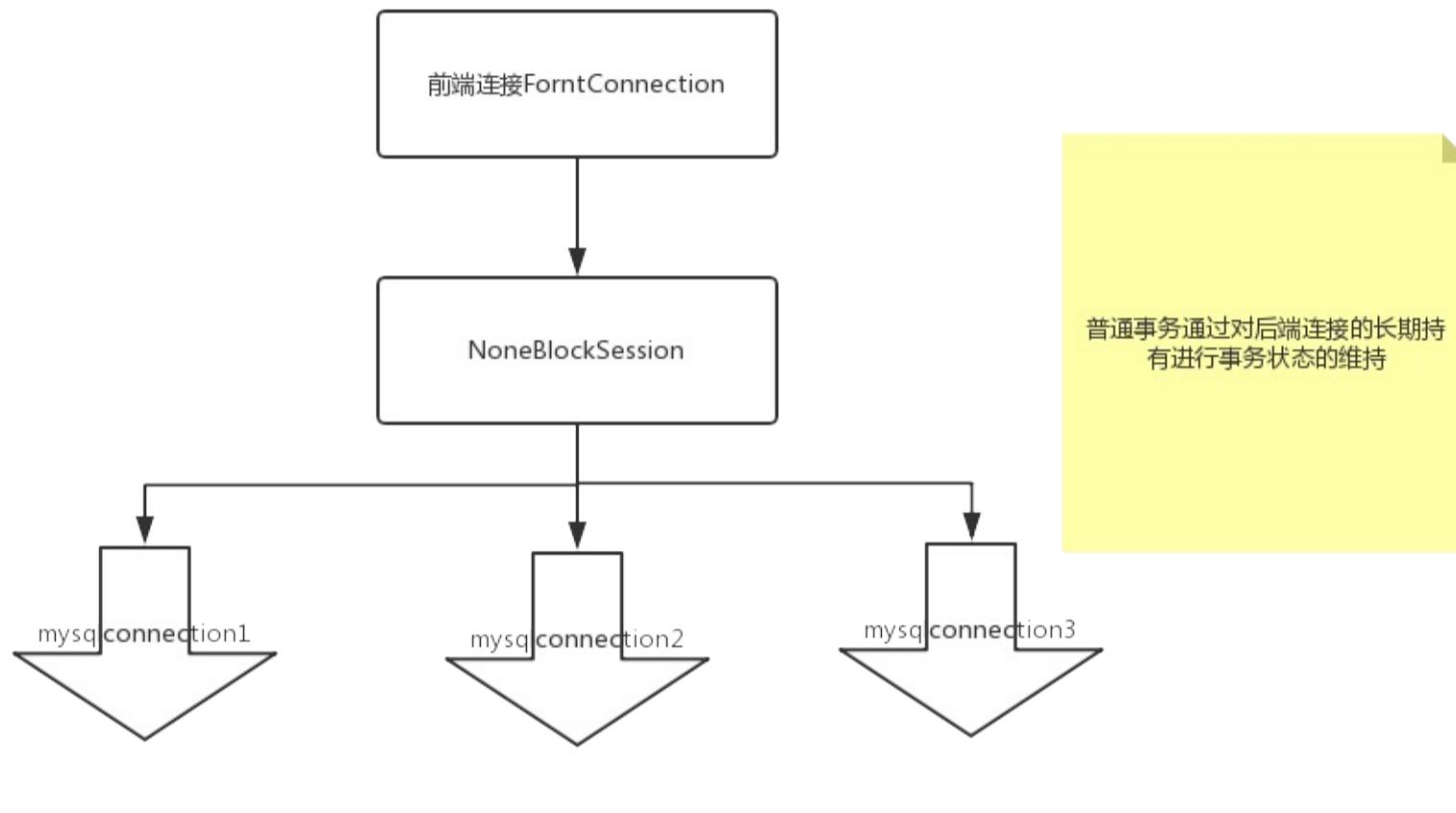
4Modifysql

Modifysql

2.5.5

mysqlfrontconnectionsessiondblesessionsessiontargetautocommittargetSQLconnectiontargetsessionsessioncommitrollback

Dblemysqlmysqlcommitdn1,dn2,dn3,dn4commitdn1,dn2,dn3dn4dn1,dn2,dn3



2.5.6 XA

2.5.6.1 &

Xid

```
Xid:xa.
ShardingXA(set xa = on)Xid_Session();
Xid_Session: Dble_Server.{instanceName}.{xaIDInc} instanceName dble, xaIDInc id.
, Xid_Session db ()Xid, ;
Xid: Dble_Server.{instanceName}.{xaIDInc}.{db}
xaIDInc :dblexalIDInc1(); xaRecoveryXid, xaIDInc XidxaIDInc+1.
xaRecovery: {xaRecoveryLogBaseDir}/{XaRecoveryLogBaseName}.log, xalogs/xalog-1.log
```

dbleXid; xaRecoverydble, xaIDInc1; XidxaIDInc, 'The XID already exists'; dbleXA.

2.5.6.2

```
ShardingdbGroup Xid: Xid_SessionXid
Xid: Dble_Server.{instanceName}.(\d)(.[^\s]+)?
Xid: Suspected residual xa transaction.....
```

Xid, Xid, ;

XidxaIDIncdble()xaIDInc, Xid.

300sbootstrap.cnf -DxaIdCheckPeriod=300

```
reload @@xaIdCheck.period=60; -- ()60s
reload @@xaIdCheck.period=0; -- 0
```

Start XaIdCheckPeriodStop XaIdCheckPeriod

2.5.6.3

xa

, dble_xa_recoverXA.

dbleXid

, session_connections(show @@connection)xa_id, xa_idXid_SessionXA.

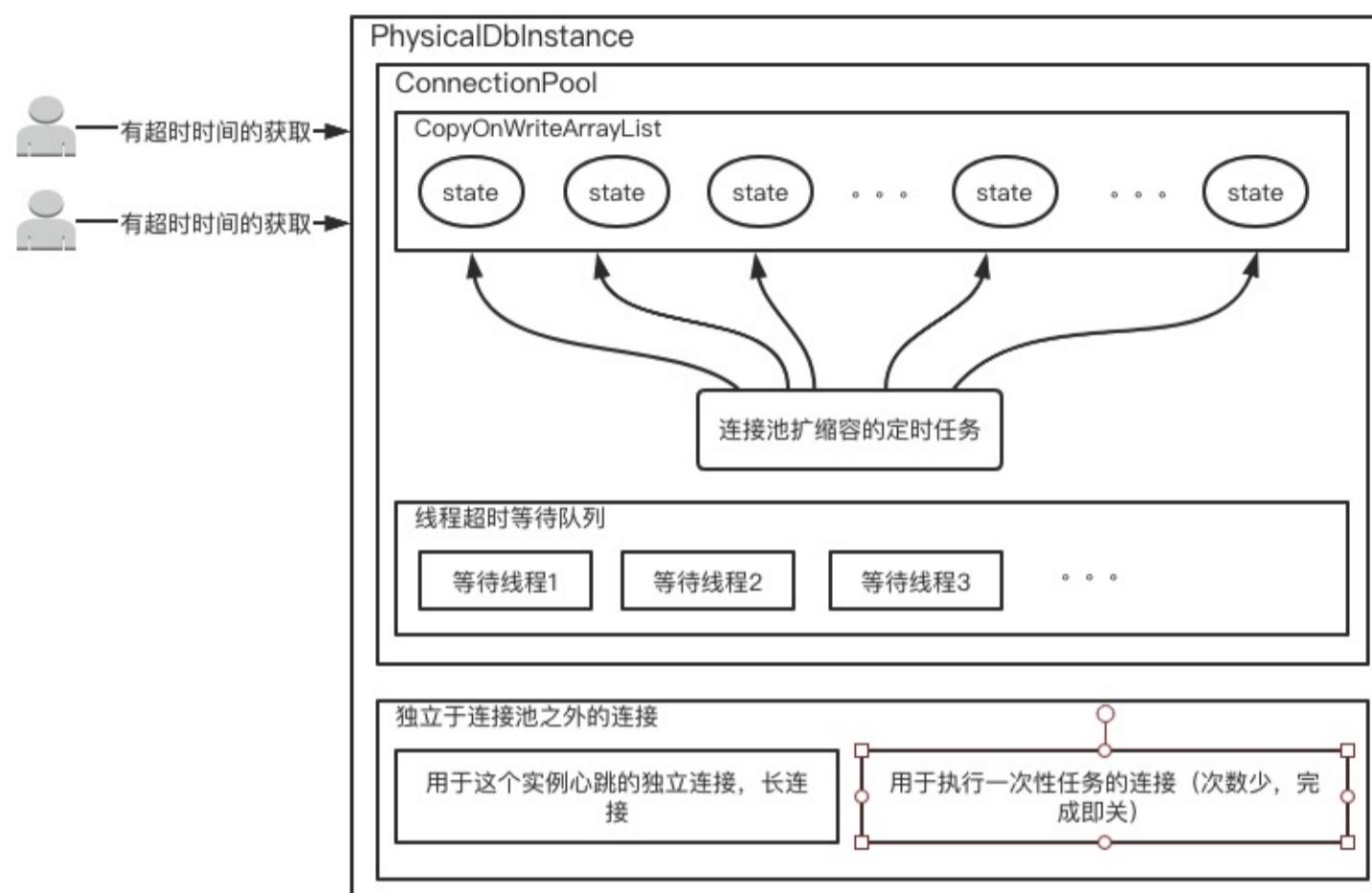
2.6

dbleMySQL PhysicalDbInstance PhysicalDbInstance

- 1.
2. MySQLOneTimeJob

2.6.1 dble

CopyOnWriteArrayList MySQLstateevictor



2.6.1.1

2.6.1.2

2.6.1.3

evictorevictor

minCon minCon min(- -) - 0

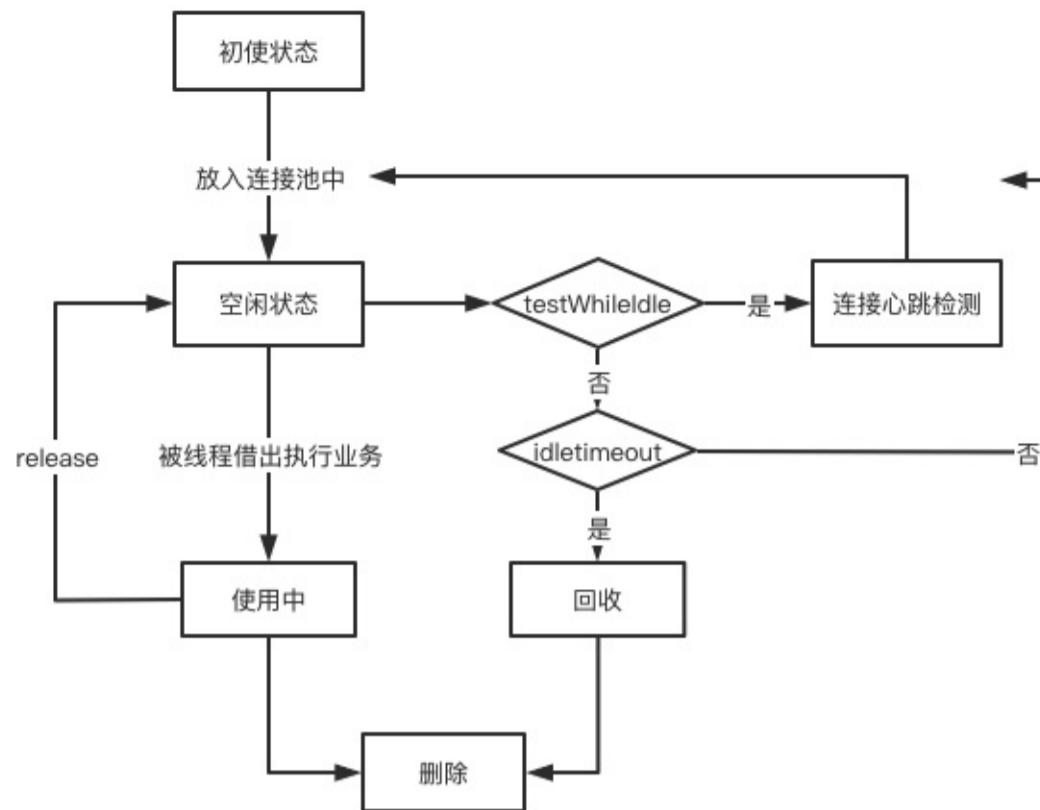
minCon minCon - > 0 && idleTimeout

2.6.1.4

- testOnCreate true ping connectionHeartbeatTimeout
- testOnBorrow true ping connectionHeartbeatTimeout
- testOnReturn true ping connectionHeartbeatTimeout
- testWhileIdle true ping connectionHeartbeatTimeout

2.6.2

CopyOnWriteArrayList MySQLstate



2.6.3

dble 2.25 dble
(flowHighLevel)(flowLowLevel)

2.6.4

testOnCreate	false
testOnBorrow	false
testOnReturn	false
testWhileIdle	false
connectionTimeout	30000 (30s)
connectionHeartbeatTimeout	20
timeBetweenEvictionRunsMillis	30000 (30s)
idleTimeout	600000 (10 minute)
heartbeatPeriodMillis	10000 (10s)
evictorShutdownTimeoutMillis	10000 (10s)
flowHighLevel	4194304
flowLowLevel	262144

```

<?xml version="1.0"?>
<!DOCTYPE dble:db SYSTEM "db.dtd">
<db:db xmlns:dble="http://dble.cloud/">

<dbGroup name="dbGroup1" rwSplitMode="1" delayThreshold="10000">
  <heartbeat errorRetryCount="1" timeout="10" keepAlive="60" >show slave status</heartbeat>
  <dbInstance name="instanceM1" url="ip4:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="true">
    <property name="testOnCreate">false</property>
    <property name="testOnBorrow">false</property>
    <property name="testOnReturn">false</property>
    <property name="testWhileIdle">true</property>
    <property name="connectionTimeout">30000</property>
    <property name="connectionHeartbeatTimeout">20</property>
    <property name="timeBetweenEvictionRunsMillis">30000</property>
    <property name="idleTimeout">600000</property>
    <property name="heartbeatPeriodMillis">10000</property>
    <property name="evictorShutdownTimeoutMillis">10000</property>
    <property name="flowHighLevel">4194304 </property>
    <property name="flowLowLevel">262144 </property>
  </dbInstance>

  <!-- can have multi read instances -->
  <dbInstance name="instanceS1" url="ip5:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="false">
    <property name="heartbeatPeriodMillis">60000</property>
  </dbInstance>
</dbGroup>

```

```
</dbGroup>
</db:db>
```

2.6.5 dble

dbMySQLheartbeatPeriodMillisdbMySQLLevictor

2.6.5.1

-
-

2.6.5.2

dble

- init
- ok
- timeoutHeartbeatTimeout
- errordble

2.6.5.3

- dbleerrorerrorRetryCountok
- dbleerrorRetryCounterror
- timeoutOK, init

2.6.6

dbledbldb.xmldbInstancedble

- dbInstancedbInstancemaxConminCon
- dbInstancemysqldblerwSplitMode=0

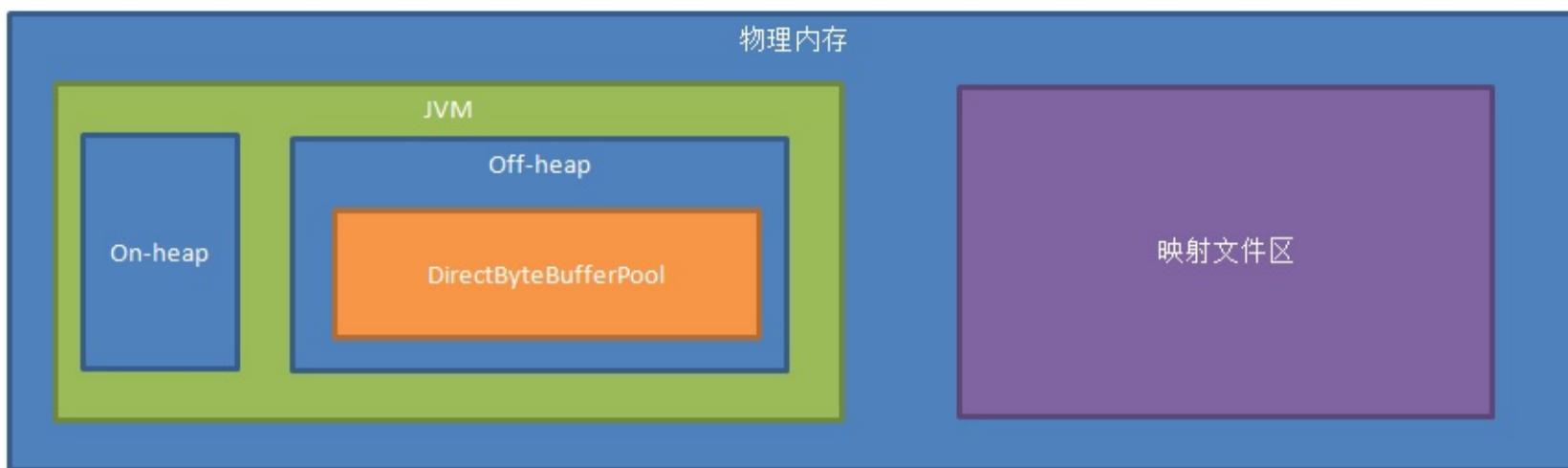
```
<dbGroup name="dbGroup1" rwSplitMode="1" delayThreshold="10000">
    <heartbeat errorRetryCount="1" timeout="10" keepAlive="60">show slave status</heartbeat>
    <dbInstance name="instanceM1" url="ip4:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="true">
    </dbInstance>
</dbGroup>
<dbGroup name="dbGroup2" rwSplitMode="1" delayThreshold="10000">
    <heartbeat errorRetryCount="1" timeout="10" keepAlive="60">show slave status</heartbeat>
    <dbInstance name="instanceM2" url="ip4:3306" user="your_user" password="your_psw" maxCon="100" minCon="10" primary="true">
    </dbInstance>
</dbGroup>
<dbGroup name="dbGroup3" rwSplitMode="1" delayThreshold="10000">
    <heartbeat errorRetryCount="1" timeout="10" keepAlive="60">show slave status</heartbeat>
    <dbInstance name="instanceM3" url="ip5:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="true">
    </dbInstance>
</dbGroup>
```

1.instanceM1instanceM2mysqldbldbInstance

2.instanceM1instanceM2mysqlinstancedb120050instanceM2100 10

2.7

2.7.1



- On-Heap JVM Xms ,Xmx jvm
- Off-Heap JVM XX:MaxDirectMemorySize
- DirectByteBufferPool = bufferPoolPageNumber*bufferPoolPageSize
bufferPoolPageNumberbufferPoolPageSizebootstrap.cnf bufferPoolPageSize2M, bufferPoolPageNumber(MaxDirectMemorySize * 0.8 /bufferPoolPageSize),
- JVM

$$\text{tmpMin} = \text{Min}(\text{free})$$

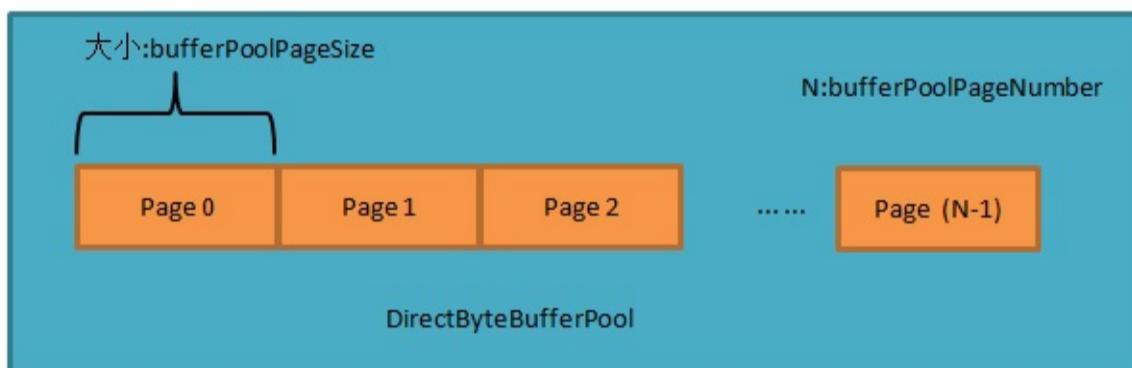
$$= ((\text{tmpMin}/\text{mappedFileSize}))$$

$$= * \text{mappedFileSize} (\text{mappedFileSize64M})$$

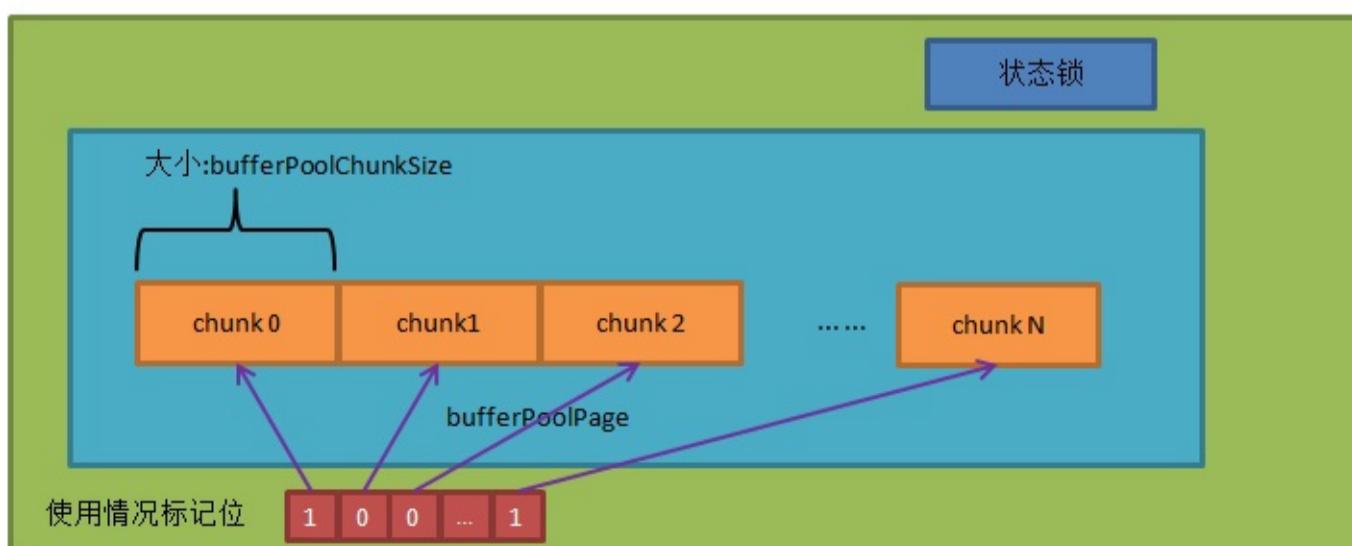
$$\text{mappedFileSizebootstrap.cnf}$$

2.7.2 DirectByteBufferPool

BufferPool



bufferPoolPage:



1.:

1.1

1.2 buffer

2.

bufferPoolPageNumberbufferPoolPageSize

3.

3.1

(bufferPoolChunkSize 4k,bufferPoolPageSize)

()

M*bufferPoolChunkSize

3.2

N+1bufferPoolPageNumber-1(N)

M

0N

(bufferPoolPageSize)On-Heap

4.

4.1 On-Heap

clearGC

4.2 Off-Heap

2.7.3

dble session

- JoinjoinMemSize(4M)join
- OrderorderMemSize(4M)
- OtherotherMemSize(4M)distinctgroupnestloop

,Heap4M

mappedFileSize

1:

2:DirectByteBufferPoolchunk

2.8 &

2.8.1

dble/

zookeeper

2.8.2

2.8.2.1 cluster.conf

ZK

```
#  
clusterEnable=true  
# zk  
clusterMode=zk  
# zk  
clusterIP=10.186.19.aa:2281,10.186.60.bb:2281  
#zkdble  
rootPath=/dble  
#dble  
clusterId=cluster-1  
# Ha  
#needSyncHa=false  
# binlog  
#showBinlogStatusTimeout=60000  
#  
sequenceHandlerType=2  
#  
#sequenceStartTime=2010-11-04 09:42:54  
#3instanceIdZK  
#sequenceInstanceByZk=true
```

2.8.2.2 bootstrap.conf

instanceName instanceId 01023 0511

2.8.3

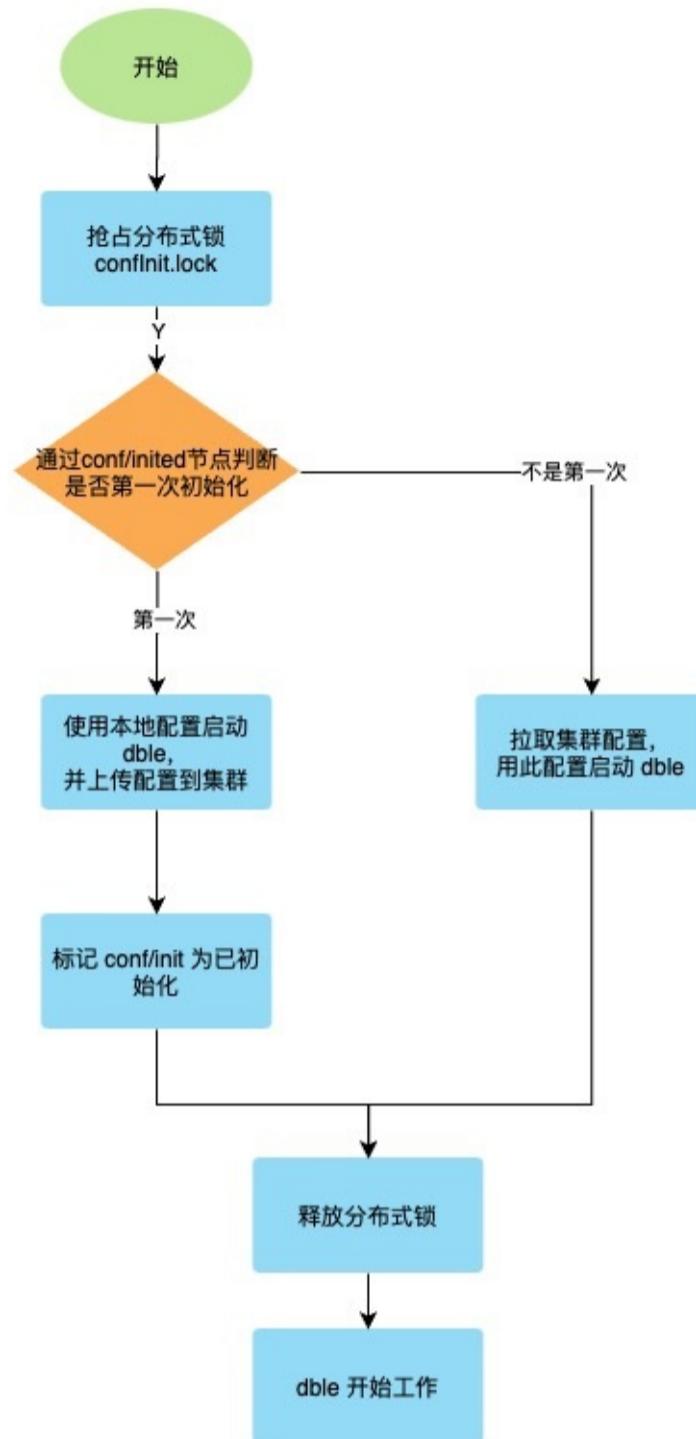
1.

init_zk_data.shZK,ZK

2.

ZK,ZK

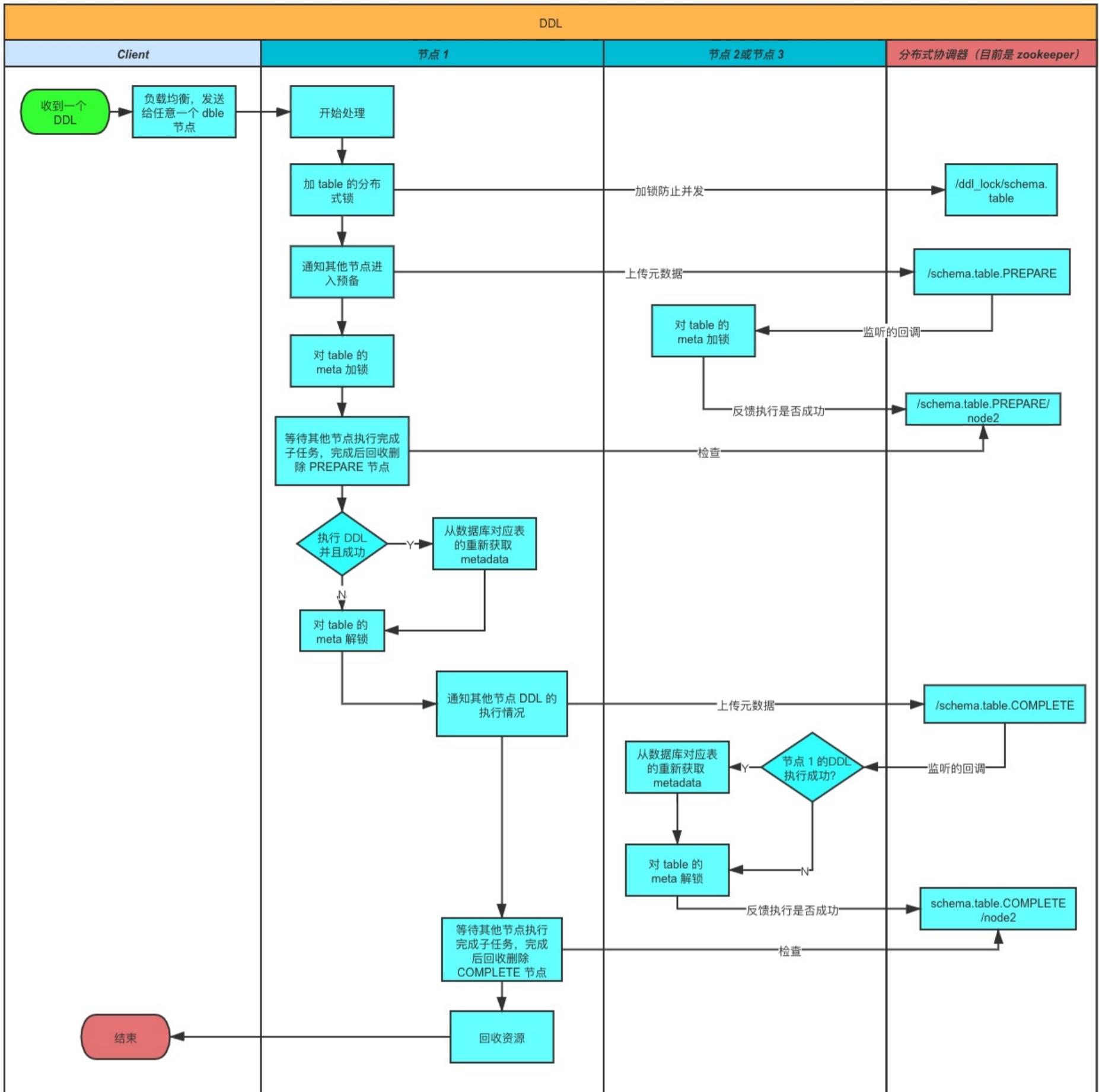
ZK



2.8.4

ADDL

DDLZKZK



1. DDL

DDL,

1. ""

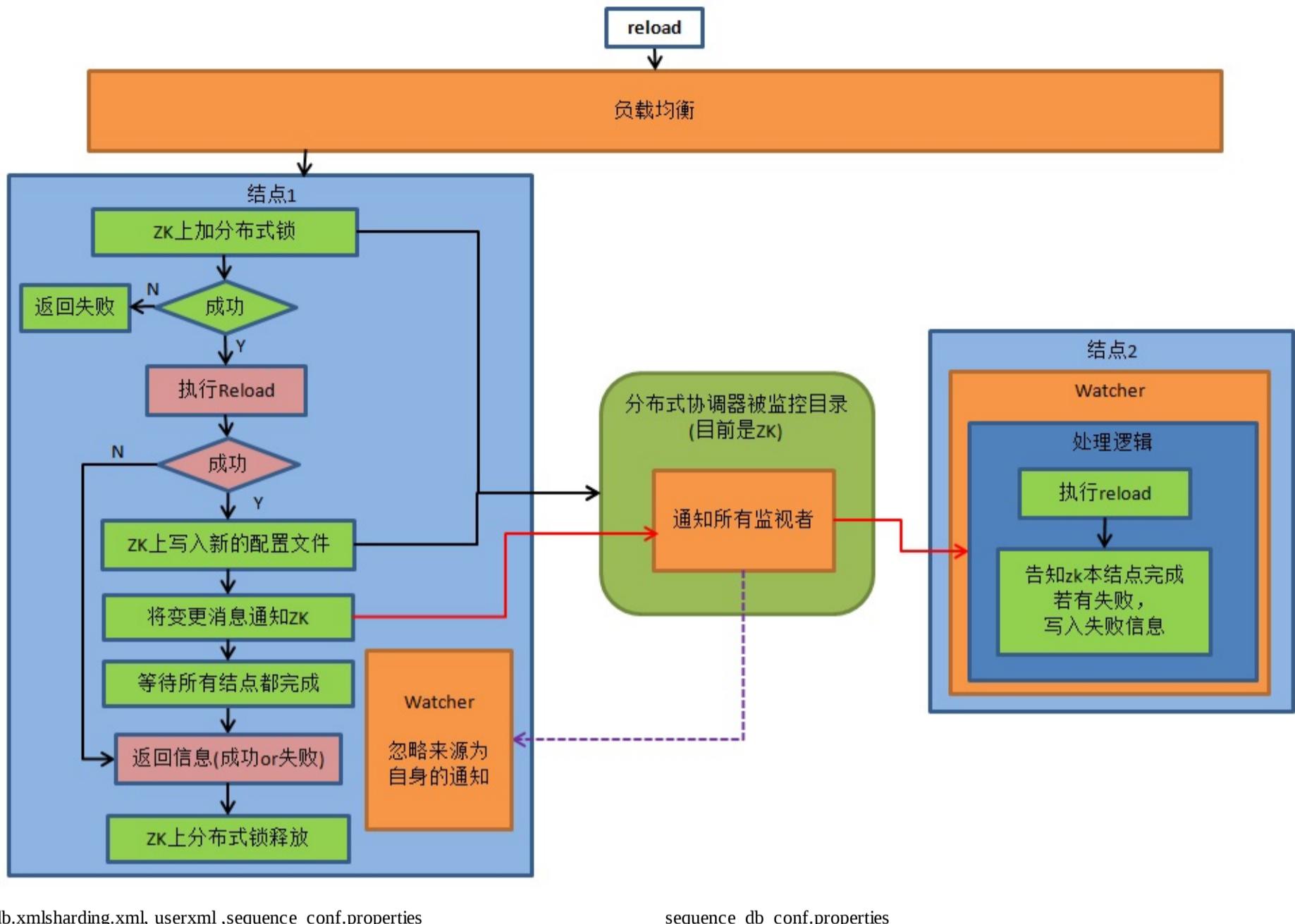
1. DDLtablemetaZKddlmetareload metadata

1. meta

(meta,reload meta)

1. :view,viewview

B.reload @@config/ reload @@config_all

**C.binlog**

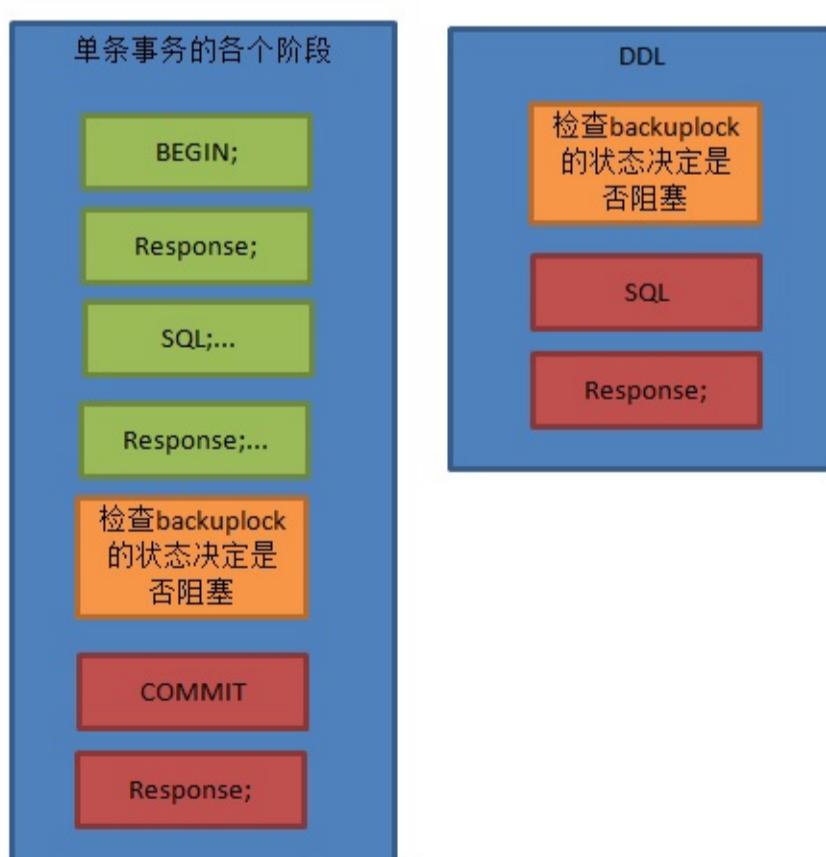
:

binlogshow master statusbinlog

```

show @@binlog.status session
sessionshow @@binlog.status
sessionsessionshow master status

```



```
:session1 tableA session2 tableA DDL          metaLock.session3 show @@binlog.status.
session1 session3, session2 session1, session3 session2.
session3 showBinlogStatusTimeout(60s)
```

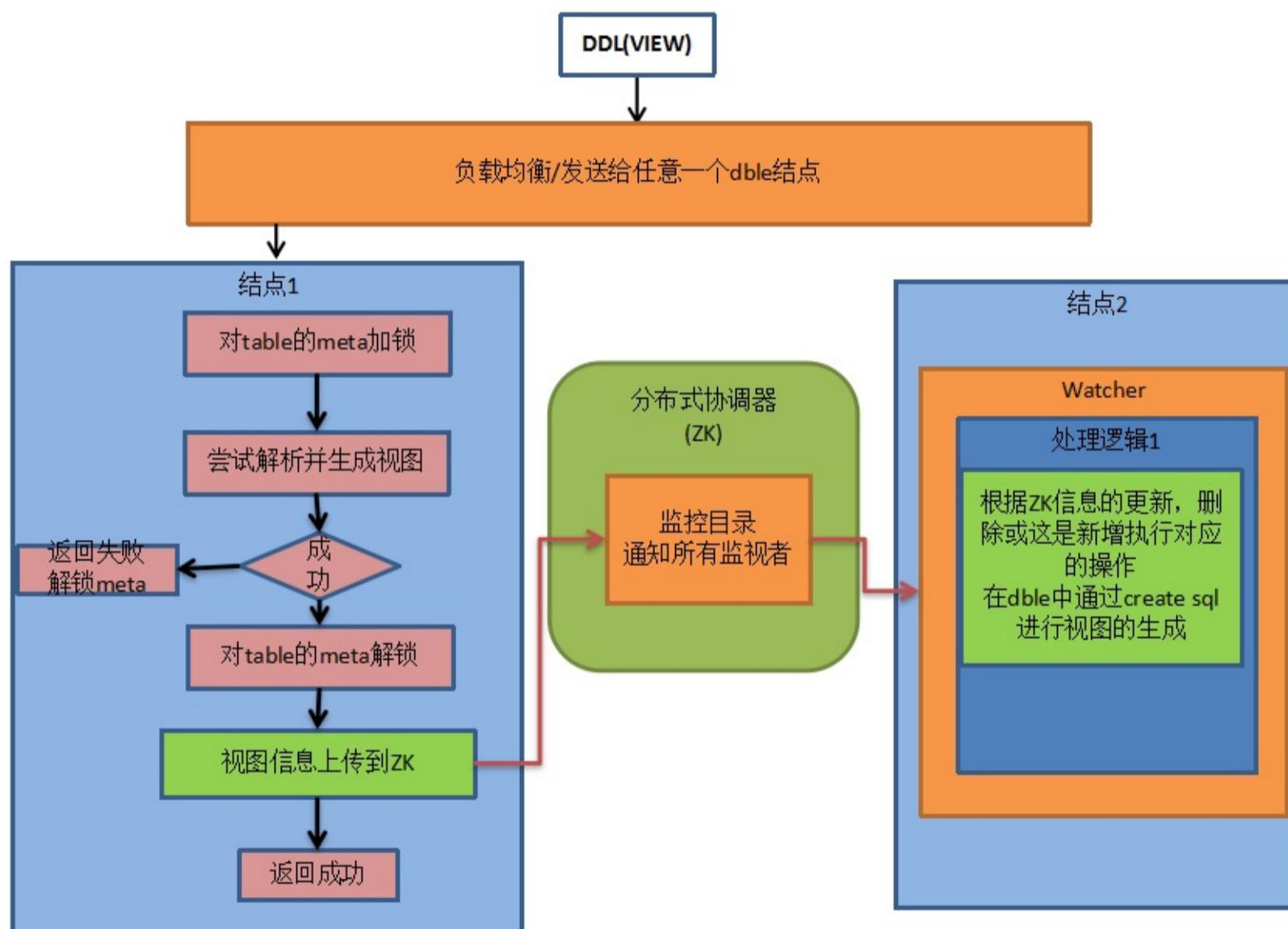
1.ZKzk
2.session
3./ZK
4.,show @@binlog.status
5.ZK

ZK

ZK/zk

D.View

zkview dble



```
zkview      key schema.table value { "serverId": "create_Server_id", "createSql": "view_create_sql"}
```

E.online

dbleonlineDDL

1.dble 2.dbleDDLBinlog

F.

needSyncHa

F.1 disable

- 1.
- 2.disable
- 3.

4.disable

5.

6.

F.2 enable

- 1.
- 2.enable
- 3.
- 4.
- 5.enable

F.3 switch

- 1.
- 2.switch
- 3.
- 4.
- 5.switch

G.

G.1 pause

1. pause_node.lock
- 2.
- 3.
- 4.
- 5.
- 6.

G.2 resume

1. pause_node.lock
- 2.
- 3.
- 4.
- 5.
- 6.

2.8.5 XA

XAzookeeper

2.8.6 ZK

```

rootPath(cluster.cnf)
  clusterId(cluster.cnf)
    conf
      init
      status
        operator
          instanceName(keybootstrap.cnf:reloadid)
        sharding(sharding.xmljson)
        db(db.xmljson)
        user(user.xmljson)
        migration()
          pause
            instanceName(keybootstrap.cnf:)
          resume
            instanceName(keybootstrap.cnf:)
        sequences
          instanceid //zk
          incr_sequence///
          table_name
          common(sequence_conf.properties sequence_db_conf.properties)
        binlog_pause
          status ()
            instanceName(keybootstrap.cnf:)
      lock
        syncMeta.lock(, )
        confInit.lock
        confChange.lock
        binlogStatus.lock
        ddl_lock/schema.table
  
```

```

view_lock/`schema`.`table`
dbGroup_locks/groupName
pause_node.lock
online
  instanceName(keybootstrap.cnf)
    ddl
      schema.table.PREPAREddl
        instanceName(keybootstrap.cnf:)
      schema.table2.COMPLETEddl ddl
        instanceName(keybootstrap.cnf:)
      schema.table3.PREPARE
xalog
  node1
  node2
view
  schema:view
operator
  schema.view:(update/delete,:createupdate)
  instanceName(keybootstrap.cnf:)

dbGroups
  dbGroup_status
    groupName
  dbGroup_response
    instanceName(keybootstrap.cnf:)

```

2.8.7

twitter snowflake ZKinstanceID
offset-step ZKStep

2.8.9

clusterMode=ucore (), ucoredble(renewThread)
clusterMode=zkzkrenew
renew lock of session success

dblerenewconf reloadrenew

renew

dble_cluster_renew_threadrenew

```

mysql> select * from dble_cluster_renew_thread;
+-----+
| renew_thread |
+-----+
| UCORE_RENEW_universe/dble-v3/ushard-1/lock/ddl_lock/testdb.tablea |
+-----+
2 rows in set (0.00 sec)

```

ucore

kill renew

```

mysql> kill @@cluster_renew_thread 'UCORE_RENEW_universe/dble-v3/ushard-1/lock/confChange.lock';
Query OK, 0 rows affected (0.00 sec)
kill cluster renew thread successfully!

```

kill manual kill cluster renew thread
dblerenew

2.8.10

单节点部署执行步骤

多结点部署额外步骤

图例

2.9 Grpc

2.9.1

Dbleucoredbleucoregrpcucore

2.9.2

cluster.cnfbootstrap.cnf

				/
url	grpcurl	cluster.cnf clusterIP	grpcIP	
port		cluster.cnf clusterPort	grpc	
serverId	ID	\$ushard-id(ip1,ip2) ,\$ushard-id bootstrap.cnf instanceName		
componentId	ID	\$ushard-id bootstrap.cnf instanceName		
componentType		ushard		

2.10 meta

Meta

- [2.10.1 Meta](#)
- [2.10.2 Meta](#)
- [2.10.3](#)
- [2.10.4 View Meta](#)

2.10.1 Meta

dble

2.10.1.1

dbleschematable1.5 sharding.xml

show tables;

show create table ...

2.10.1.2

DbleDble

1 view

2 ZKview

view meta2.10.4 view meta

2.10.1.3

:

- ;
-
-
-
-

2.10.2 Meta

dbledddll

- create table
- drop table
- alter table
- truncate table
- create index
- drop index

zookeeper(1.1 cluster.cnf)Meta:

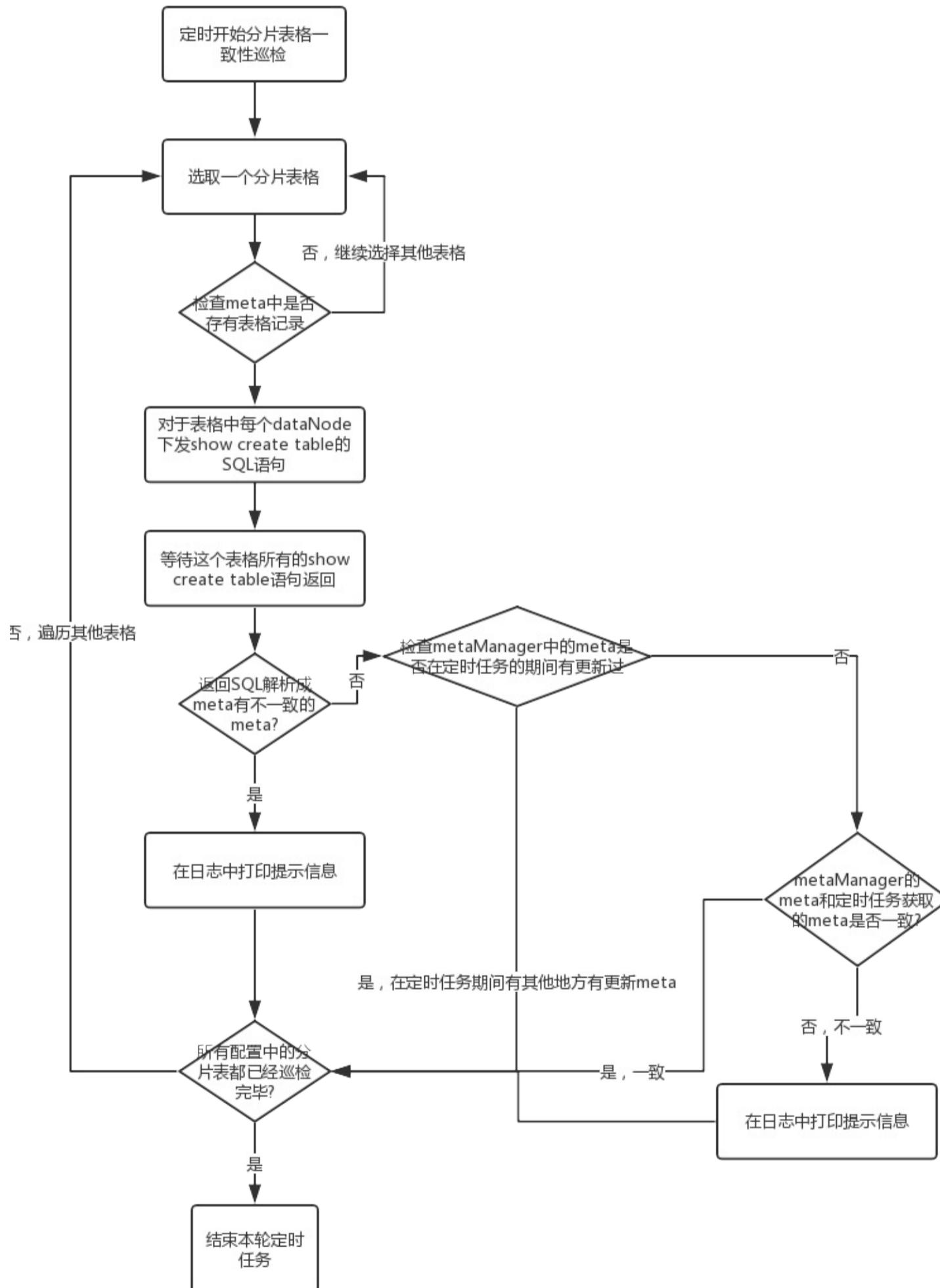
1. zookeeper
 - dbled
2. zookeeper
 - :
 - a. dblezookeeper
 - b. dblezookepr
 - c. dble

2.10.3

DbledbleDbleDble

tableStructureCheckTask checkTableConsistencyPeriod 30×60×1000 30 checkTableConsistency 0 bootstrap.cnf

- schematable
- meta
- SQL “show create table”
- metaSet
- metameta
- metametameta



2.10.4 view meta

2.10.4.1 view

- mysqlview
- dbleview

2.10.4.2 view meta

Dble 2.18.11.0 viewviewVIEWselectquerySQLview

MySQLView metaDbleviewDbleviewDbleDbleviewXASQL

-
- ZK

DblemetaZKSQlmeta

Dble 2.19.10.0mysql viewmysql viewdblemysql mysql viewview schema

```
<schema name="schema2" sqlMaxLimit="100" shardingNode="dn5">
</schema>
```

viewshardingNode dn5 mysql viewdbleview metysql view dblereaddble

2.10.4.2 view meta

JSONbootstrap.cnfviewPersistenceConfBaseDirviewPersistenceConfBaseName./viewConf/viewJson,

```
[{
  "schema": "testdb",
  "list": [
    {
      "name": "view_test",
      "sql": "create view view_test as select * from a_test"
    },
    {
      "name": "vt2",
      "sql": "create or replace view vt2 as select * from suntest"
    },
    {
      "name": "suntest",
      "sql": "create view suntest as select * from sbtest"
    }
  ]
}]
```

ZK KV

DbleviewkeyZK BASE_PATH/viewkeyschema_name:view_nameviewjsoncreate sqlserverID

```
{
  "serverId": "10010",
  "createSql": "create view view_test as select * from a_test"
}
```

JSONvalue /....view/testdb:view_test

2.11

- [2.11.1](#)
- [2.11.2](#)
- [2.11.3](#)
- [2.11.4](#)
- [2.11.5 heartbeat](#)
- [2.11.6](#)
- [2.11.7 sql](#)

2.11.1

```
dble  
enableStatisticAnalysis
```

2.11.1.1

```
reload @@query_cf=table&column;
```

```
table column
```

```
reload @@query_cf;
```

2.11.1.2

```
show @@sql.condition;
```

2.11.2

enableStatisticAnalysis

2.11.2.1

-
-
-
-

2.11.2.2

```
show @@sql.sum.table;
```

```
show @@sql.sum.table true;
```

2.11.3

enableStatisticAnalysis

2.11.3.1

-
-
-

2.11.3.2

```
+ show @@sql.sum;
+ show @@sql.sum.user;
```

2.11.4

dble

1. initDB
2. query
3. stmtPrepare
4. stmtSendLongData
5. stmtReset
6. stmtExecute
7. stmtClose
8. ping
9. kill
10. quit
11. heartbeat
12. other

2.11.4.1

- show @@command;
- show @@command.count; [2.1](#)

2.11.5 heartbeat

heartbeatmysqlheartbeatmysqlheartbeat

2.11.5.1

heartbeatheartbeat

2.11.5.2

heartbeat

- show @@heartbeat;
- show @@heartbeat.detail where name=xxx; xxxdbinstance
- show @@dbinstance.synstatus;
- show @@dbinstance.syndetail where name=xxx;xxxdbinstance

[2.1](#)

2.11.6

dble

2.11.6.1

-
-
- /

2.11.6.2

- show @@connection;
- show @@backend;
- show @@connection.sql;

[2.1](#)

2.11.7 sql

```
sql, samplingRate=100 sql_log    sql
```

2.11.3.1

1. sql
2. sql
3. sql
4. sql10000 5maxResultSet

2.11.3.2 sql

```
+ show @@sql;
+ show @@sql.high;
+ show @@sql.slow;
+ show @@sql.large;
+ show @@sql.resultset;
```

2.11.3.3

```
truncate sql_log
```

2.12

2.20.04.0,
 MySQL:
 dblepython3dble,bootstrap.cnfsystemuseOuterHa false
 dblesystemuseOuterHa true.

2.12.1

- dblebootstrap.cnfsystemuseOuterHa false
- python3"python"

2.12.2

dbledblepython3db.xmldbe

dble

```
show @@custom_mysql_ha
```

python

```
enable @@custom_mysql_ha
```

```
disable @@custom_mysql_ha
```

2.12.2

2.12.2.1 linux

2.12.2.2 reload

reload @@config python
 1. disable @@custom_mysql_ha
 2.
 3. reload @@config
 4. enable @@custom_mysql_ha

2.12.2.3 python

custom_mysql_ha.py dblebin,python3,

1Python3,python3

```
/usr/local/bin/python3 --version
/usr/local/bin/pip3 --version
```

2mysqlclient

CentOS

```
yum install mysql-devel
```

or Ubuntu

```
apt-get install libmysqlclient-dev
```

```
pip3 install mysqlclient
```

3six

```
pip3 install six
```

or

```
pip3 install six -i http://pypi.douban.com/simple --trusted-host pypi.douban.com
```

4coloredlogs

```
pip3 install coloredlogs
```

or

```
pip3 install coloredlogs -i http://pypi.douban.com/simple --trusted-host pypi.douban.com
```

5rsa

```
pip3 install rsa
```

or

```
pip3 install rsa -i http://pypi.douban.com/simple --trusted-host pypi.douban.com
```

2.13

2.13.1

- bootstrap.cnfprocessorCheckPeriod
- bootstrap.cnfidleTimeout
-

2.13.2 SQL

- bootstrap.cnfprocessorCheckPeriod
- sqlExecuteTimeout
- DDL

2.14 ER

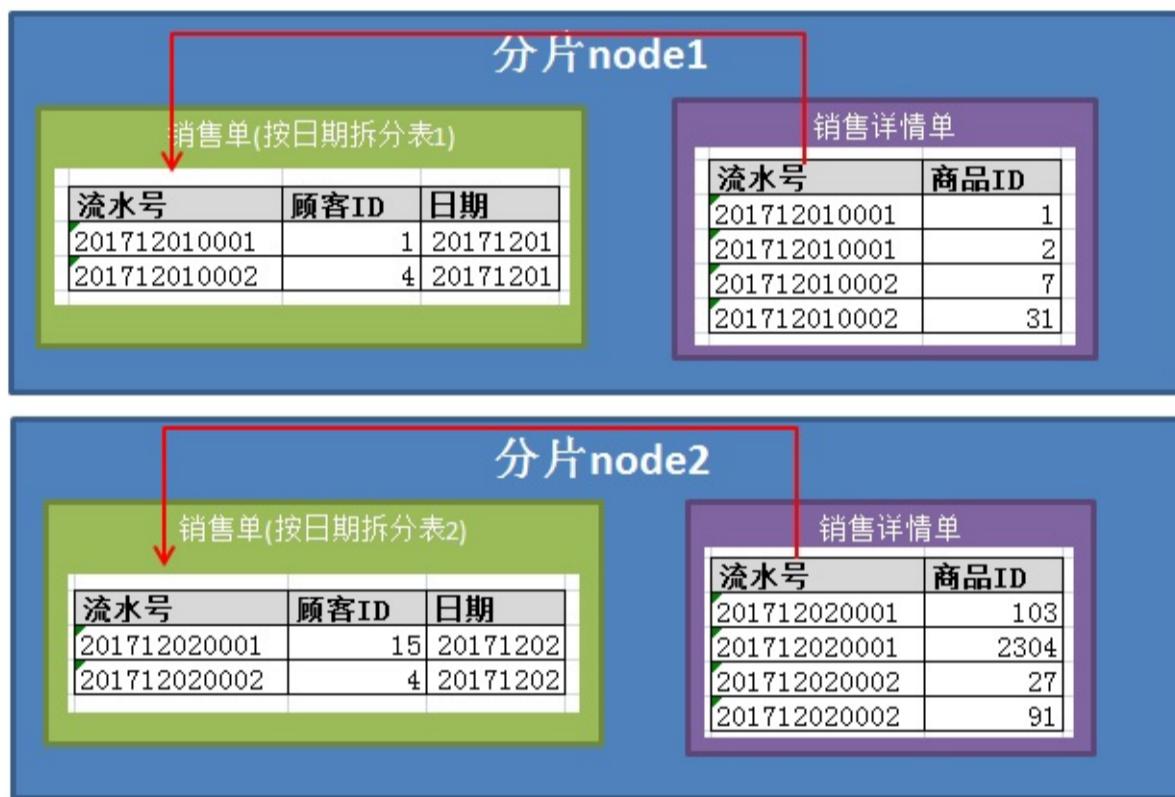
2.14.1 ER

join, nest loop
join

销售单		
流水号	顾客ID	日期
201712010001	1	20171201
201712010002	4	20171201
201712020001	15	20171202
201712020002	4	20171202

销售详情单	
流水号	商品ID
201712010001	1
201712010001	2
201712010002	7
201712010002	31
201712020001	103
201712020001	2304
201712020002	27
201712020002	91

join
:



ER

```
<shardingTable name="sales" shardingNode="dn1,dn2" function="sharding" shardingColumn="id">
<childTable name="sales_detail" joinColumn="sales_detail_pos_num" parentColumn="sales_pos_num"/>
</table>
```

2.14.2 ER

2dbleERER

```
<!--schema-->
<shardingTable name="tableA" shardingNode="dn1,dn2" function="hash_function" shardingColumn="id_a" />
<shardingTable name="tableB" shardingNode="dn1,dn2" function="hash_function" shardingColumn="id_b" />
<shardingTable name="tableC" shardingNode="dn2,dn1" function="hash_function" shardingColumn="id_c" />
<shardingTable name="tableD" shardingNode="dn3,dn4" function="hash_function" shardingColumn="id_a" />
<shardingTable name="tableE" shardingNode="dn1,dn2" function="hash_function" shardingColumn="id_a" />
<shardingTable name="tableF" shardingNode="dn1,dn2" function="enum_par" shardingColumn="id_a" />

<!--rfunction-->
<function name="enum_par"
  class="com.actiontech.dble.route.function.PartitionByFileMap">
  <property name="mapFile">partition-hash-int.txt</property>
</function>
```

```
<function name="hash_function" class="com.actiontech.dble.route.function.PartitionByLong">
  <property name="partitionCount">2</property>
  <property name="partitionLength">512</property>
</function>
```

functionER

table			function	
tableA	id_a	dn1,dn2	hash_function	1
tableB	id_b	dn1,dn2	hash_function	1
tableC	id_c	dn2,dn1	hash_function	2
tableD	id_a	dn3,dn4	hash_function	3
tableE	id_a	dn1,dn2	hash_function	1
tableF	id_a	dn1,dn2	enum_par	4

ER

```
<tableA.id_a , tableB.id_b, tableE.id_a >

<tableC.id_c>

<tableD.id_a>

<tableF.id_a>
```

PSschemaschemaERER.

2.15 global

“”“”

:

•

•

•

dble “”

•

•

• JOIN

JOIN

:



;

JOIN.

JOIN (SQL):

```

SELECT , , COUNT(*) AS
FROM
JOIN USING(ID)
WHERE ()
GROUP BY ,

```

2.16 cache

cache 1.6

2.16.1

[sql,]

KEYpool.SQLRouteCache

VALUE cachefactoryname,

2.16.2 ER

[joinColumn,]

KEYpool.ER_SQL2PARENTID

VALUEcachefactoryname,

2.17

2.17.1

SQLSQL

2.17.2

dbledble

dble: SQLdbleSQLSQLSQL

: MySQL

2.17.3 dble

dbleEXPLAINdble1

```
explain select * from test;
+-----+-----+-----+
| SHARDING_NODE | TYPE      | SQL/REF           |
+-----+-----+-----+
| dn1          | BASE SQL | SELECT * FROM test LIMIT 100 |
| dn2          | BASE SQL | SELECT * FROM test LIMIT 100 |
+-----+-----+-----+
2 rows in set (0.01 sec)
```

2

```
mysql> explain select * from test where id =1;
+-----+-----+-----+
| SHARDING_NODE | TYPE      | SQL/REF           |
+-----+-----+-----+
| dn1          | BASE SQL | select * from test where id =1 |
+-----+-----+-----+
1 row in set (0.04 sec)
```

EXPLAINSQ

3:

```
mysql> explain select * from sharding_two_node a inner join sharding_four_node b on a.id =b.id;
```

```
+-----+-----+-----+
| SHARDING_NODE | TYPE      | SQL/REF           |
+-----+-----+-----+
| dn1.0         | BASE SQL | select `a`.`id`, `a`.`c_char`, `a`.`ts`, `a`.`si` from `sharding_two_node` `a` ORDER BY `a`.`id` ASC |
| dn2.0         | BASE SQL | select `a`.`id`, `a`.`c_char`, `a`.`ts`, `a`.`si` from `sharding_two_node` `a` ORDER BY `a`.`id` ASC |
| dn1.1         | BASE SQL | select `b`.`id`, `b`.`c_flag`, `b`.`c_decimal` from `sharding_four_node` `b` ORDER BY `b`.`id` ASC |
| dn2.1         | BASE SQL | select `b`.`id`, `b`.`c_flag`, `b`.`c_decimal` from `sharding_four_node` `b` ORDER BY `b`.`id` ASC |
| dn3.0         | BASE SQL | select `b`.`id`, `b`.`c_flag`, `b`.`c_decimal` from `sharding_four_node` `b` ORDER BY `b`.`id` ASC |
| dn4.0         | BASE SQL | select `b`.`id`, `b`.`c_flag`, `b`.`c_decimal` from `sharding_four_node` `b` ORDER BY `b`.`id` ASC |
| merge.1       | MERGE    | dn1.0, dn2.0     |
| merge.2       | MERGE    | dn1.1, dn2.1, dn3.0, dn4.0 |
| join.1        | JOIN     | merge.1, merge.2 |
+-----+-----+-----+
9 rows in set (0.00 sec)
```

4:

```
mysql> explain select id from single union all select b.si from sharding_four_node a inner join sharding_two_node b on a.id =b.id
+-----+-----+-----+
| SHARDING_NODE | TYPE      | SQL/REF           |
+-----+-----+-----+
| dn1.0         | BASE SQL | select `single`.`id` from `single`          |
| dn1.1         | BASE SQL | select `a`.`id` from `sharding_four_node` `a` ORDER BY `a`.`id` ASC |
| dn2.0         | BASE SQL | select `a`.`id` from `sharding_four_node` `a` ORDER BY `a`.`id` ASC |
| dn3.0         | BASE SQL | select `a`.`id` from `sharding_four_node` `a` ORDER BY `a`.`id` ASC |
| dn4.0         | BASE SQL | select `a`.`id` from `sharding_four_node` `a` ORDER BY `a`.`id` ASC |
| dn1.2         | BASE SQL | select `b`.`si`, `b`.`id` from `sharding_two_node` `b` ORDER BY `b`.`id` ASC |
| dn2.1         | BASE SQL | select `b`.`si`, `b`.`id` from `sharding_two_node` `b` ORDER BY `b`.`id` ASC |
| merge.2       | MERGE    | dn1.1, dn2.0, dn3.0, dn4.0                 |
| merge.3       | MERGE    | dn1.2, dn2.1                                |
+-----+-----+-----+
```

```
| join.1      | JOIN      | merge.2, merge.3
| merge.1    | MERGE     | dn1.0
| union_all.1 | UNION_ALL | join.1, merge.1
+-----+-----+
12 rows in set (0.01 sec)
```

3SHARDING_NODE,TYPESQL/REF

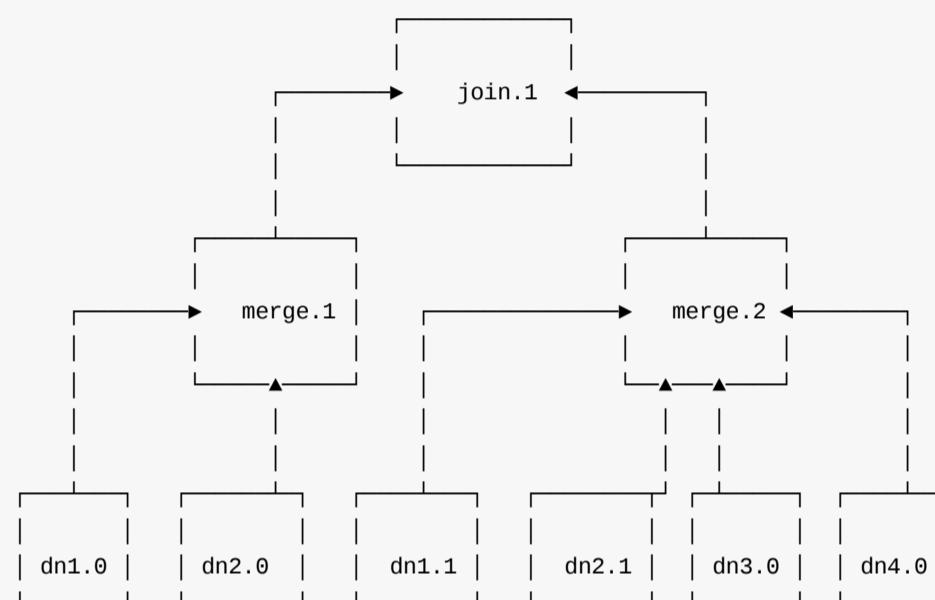
2.17.3.1

12

- **SHARDING_NODE**sharding.xmlshardingNodenamesql
- **TYPE BASE SQL ,**
- **SQL/REFSQL,SQL1limit 100**

2.17.3.2

dble3join



- **SHARDING_NODE**sharding.xmlshardingNodenamesql
- **TYPE BASE SQL ,**
 - MERGE
 - MERGE_AND_ORDER
 - AGGREGATE
 - DISTINCT
 - LIMITn
 - WHERE_FILTERwhere
 - HAVING_FILTERhaving
 - SHUFFLE_FIELD&
 - UNION_ALLunion allsqlunionUNION_ALLDISTINCT
 - ORDER
 - NOT_INnot in
 - JOINjoin
 - DIRECT_GROUPgroup by
 - NEST_LOOPNEST_LOOP join
 - IN_SUB_QUERYin
 - ALL_ANY_SUB_QUERYall/any
 - SCALAR_SUB_QUERY
 - RENAME_DERIVED_SUB_QUERYDERIVED
 - INNER_FUNC_ADD sqldbleLAST_INSERT_ID
 - INNER_FUNC_MERGEsqlselecttdbleLAST_INSERT_ID
 - for CHILD in UPDATE_SUB_QUERY.RESULTUpdateselectupdate
 - MERGE_UPDATEupdate
- **SQL/REFSQL,SQL SHARDING_NODE,**

2.17.4

EXPLAIN2

```
mysql> explain2 shardingnode=dn1 sql=select * from test where id =1;
+-----+-----+-----+-----+-----+-----+-----+
```

```
| id | select_type | table | partitions | type | possible_keys | key | key_len | ref | rows | filtered | Extra |  
+---+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+  
| 1 | SIMPLE | test | NULL | ALL | NULL | NULL | NULL | NULL | 1 | 100.00 | Using where |  
+---+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+  
1 row in set, 1 warning (0.01 sec)
```

explain2sql explain sharding node explain sql

2.18

- Btrace()
- managershow @@thread_used()

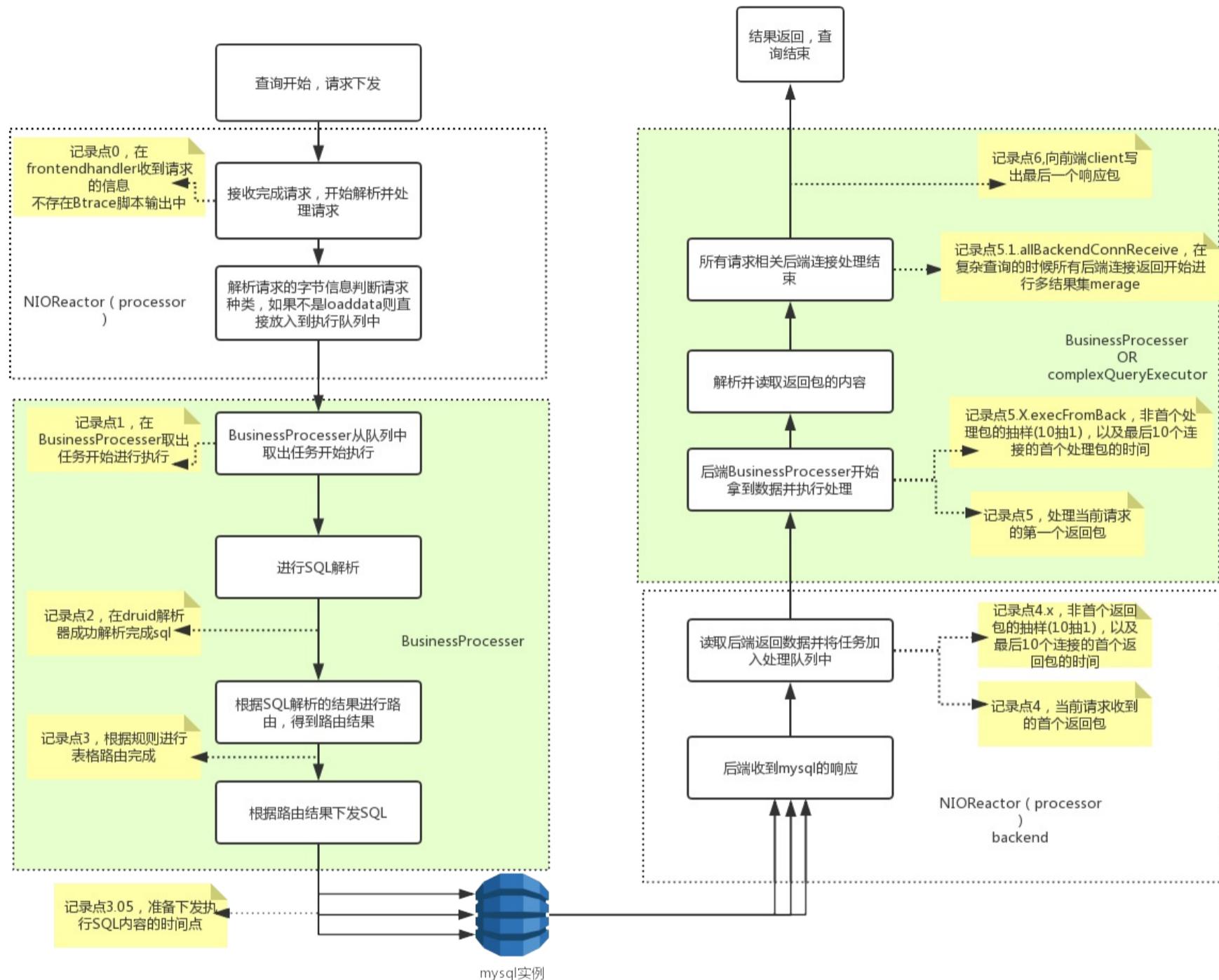
2.18.1 Btrace

2.18.1.1

Dble, [BTraceCostTime.java](#) Btrace, Btrace v.1.3

Btrace <https://github.com/btracingio/btrace>

```
bootstrap.cnfuseCostTimeStatcostSamplePercentuseCostTimeStat = 1costSamplePercent1%btrace
```



btrace dble

profiling:	Block	Invocations	SelfTime.Total	SelfTime.Avg	SelfTime.Min	SelfTime.Max	WallTime.Total	WallTime.Avg	WallTime.Min	WallTime.Max
	request->1.startProcess	9073	-638142734	-70334	-1051058	493260	202952071	22368	10565	493260
	request->2.endParse	9073	234134936	25805	13206	523393	437087007	48174	23771	1016653
	request->3.endRoute	9073	404389553	44570	20123	121474	841476560	92745	43894	1075553
	request->4.resFromBack	9073	592398	65	-649019	1602901	4805691043	529669	261612	1602901
	request->5.startExecuteBackend	9073	-56808823	-6261	-1749483	2020297	5047581273	556329	350530	2020297
	request->6.response	9073	59150286	6519	3045	366620	5107315454	562913	353575	2386917

Block, Invocations, WallTime.

, SelfTime. btrace

2.18.1.2

- 0 : 0dble
- 1.startProcess :
- 2.endParse : SQL
- 3.endRoute : SQL
- 3.05 readyToDeliver : SQL
- 4.resFromBack :
- 4.X.resFromBack : ,4.3.resFromBackdble1

- 5.startExecuteBackend :
- 5.X.startExecuteBackend : 5.3.startExecuteBackend
- 5.1.allBackendConnReceive merge
- 6.response :

:BtraceSQLSQLSQL

2.18.1.3

- 1-0bootstrap.cnffrontWorker 0dble01-0request->1.startProcess
- 4-3bootstrap.cnfNIOBackendRW
- 5-4bootstrap.cnfbackendWorker

2.18.2 Manager

2.18.2.1

Dble 18.02.0managerbootstrap.cnfuseThreadUsageStat

show @@thread_useddble

THREAD_NAME	LAST_QUARTER_MIN	LAST_MINUTE	LAST_FIVE_MINUTE
backendBusinessExecutor2	0%	0%	0%
backendBusinessExecutor1	0%	0%	0%
backendBusinessExecutor0	0%	0%	0%
BusinessExecutor3	0%	0%	0%
\$_NIO_REACTOR_BACKEND-2	0%	0%	0%
BusinessExecutor1	0%	0%	0%
\$_NIO_REACTOR_BACKEND-3	0%	0%	0%
BusinessExecutor2	12%	3%	3%
\$_NIO_REACTOR_BACKEND-0	0%	0%	0%
\$_NIO_REACTOR_FRONT-0	0%	0%	0%
\$_NIO_REACTOR_BACKEND-1	0%	0%	0%
BusinessExecutor0	0%	0%	0%

12 rows in set (0.00 sec)

- BusinessExecutorX
sqlmysql
- backendWorkerX
mysqlclient
- \$_NIO_REACTOR_FRONT_X
,,BusinessExecutor
- \$_NIO_REACTOR_BACKEND_X
mysqlbackendWorker

2.18.2.2

80%

- NIOFrontRW_NIO_REACTOR_FRONT_X
- NIOBackendRW_NIO_REACTOR_BACKEND_X
- backendWorker backendWorkerX
- frontWorker BusinessExecutorX

2.19 reload

reload @@config_all dbGroup/dbInstancereload
dbGroup/dbInstancedbGroup/dbInstancedbGroup/dbInstance

2.19.1 reload @@config_all

:

2.19.1.1 dbGroup

,dbGroupschmea,

2.19.1.2 dbGroup

2.19.1.3 dbGroup

show @@backend

[2.0.1.32 recycling_resource](#)

2.19.1.4 dbInstance

2.19.1.5 dbInstance

[2.0.1.32 recycling_resource](#)

2.19.1.6 dbInstance

[2.0.1.32 recycling_resource](#)

2.19.2 reload @@config_all -f

:

2.19.2.1 dbGroup/dbInstance

,dbGroup/dbInstance

2.19.2.2 dbGroup/dbInstance

2.19.2.3 dbGroup/dbInstance

2.19.3 reload @@config_all -r

dbGroup/dbInstance

show @@backend

[2.0.1.32 recycling_resource](#)

2.19.4 reload @@config_all -s

dbGroup

2.20

MySQLLdble serverMySQL(MySQLmysqldumpslowPerconapt-query-digest)
SQL show @@connection.sql.status where FRONT_ID= ?;

2.20.1 bootstrap.cnf6

```
<!-- -->
-DenableSlowLog=1
<!-- -->
-DslowLogBaseDir=./slowlogs
<!-- -->
-DslowLogBaseName=slow-query
<!-- -->
-DflushSlowLogPeriod=1
<!-- -->
-DflushSlowLogSize=1000
<!-- , -->
-DsqlSlowTime=100
```

2.20.2

```
enable @@slow_query_log; --
show @@slow_query_log; --
disable @@slow_query_log; --
show @@slow_query_log; --

show @@slow_query.time; --
reload @@slow_query.time=200; --

show @@slow_query.flushperiod; --
reload @@slow_query.flushperiod=2; --

show @@slow_query.flushsize;--
reload @@slow_query.flushsize=1100; --
```

2.20.3 MySQL mysqldumpslow Percona pt-query-digest

```
:
/FAKE_PATH/mysqld, Version: FAKE_VERSION. started with:
Tcp port: 3320 Unix socket: FAKE_SOCK
Time           Id Command    Argument
# Time: 2018-08-23T17:40:10.149000Z
# User@Host: root[root] @ [0:0:0:0:0:0:1]  Id:    2
# Query_time: 0.132709  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0  Read_SQL: 0.000350  Prepare_Push: 0.116678  dn1_First_Result_Fetch: 0.013686  dn1_Last_Result_Fetch: 0.001422  Write_Client: 0.001995
SET timestamp=1535017210149;
select * from sharding_two_node where id =1;
# Time: 2018-08-23T17:40:10.200000Z
# User@Host: root[root] @ [0:0:0:0:0:0:1]  Id:    2
# Query_time: 0.035600  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0  Read_SQL: 0.000062  Prepare_Push: 0.006733  dn2_First_Result_Fetch: 0.012524  dn1_First_Result_Fetch: 0.010971  dn2_Last_Result_Fetch: 0.015368  dn1_Last_Result_Fetch: 0.005119  Write_Client: 0.017834
SET timestamp=1535017210200;
select * from sharding_two_node;
# Time: 2018-08-23T17:40:10.282000Z
# User@Host: root[root] @ [0:0:0:0:0:0:1]  Id:    2
# Query_time: 0.045337  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0  Read_SQL: 0.000166  Prepare_Push: 0.003941  dn1_First_Result_Fetch: 0.039652  dn1_Last_Result_Fetch: 0.000300  Write_Client: 0.001578
SET timestamp=1535017210282;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:10.315000Z
# User@Host: root[root] @ [0:0:0:0:0:0:1]  Id:    2
# Query_time: 0.031232  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0  Read_SQL: 0.005467  Prepare_Push: 0.001989  dn2_First_Result_Fetch: 0.020240  dn2_Last_Result_Fetch: 0.001900  Write_Client: 0.003536
SET timestamp=1535017210315;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:10.432000Z
# User@Host: root[root] @ [0:0:0:0:0:0:1]  Id:    2
# Query_time: 0.116672  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0  Read_SQL: 0.013625  Prepare_Push: 0.024767  dn2_First_Result_Fetch: 0.056395  dn1_First_Result_Fetch: 0.026420  dn2_Last_Result_Fetch: 0.000743  dn1_Last_Result_Fetch: 0.001700  Write_Client: 0.051861
SET timestamp=1535017210432;
insert into sharding_two_node values(15, '15', 15), (519, '519', 519);
```

```

# Time: 2018-08-23T17:40:10.772000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.338569 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000082 Prepare_Push: 0.258365 dn1_0_First_Result_Fetch: 0.047494 dn1_0_Last_Result_Fetch: 0.029018 dn2_0_First_Result_Fetch: 0.042964 dn2_0_Last_Result_Fetch: 0.033525 Write_Client: 0.009385
SET timestamp=1535017210772;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:10.821000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.046745 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000059 Prepare_Push: 0.025401 dn1_0_First_Result_Fetch: 0.011755 dn1_0_Last_Result_Fetch: 0.001180 Generate_New_Query: 0.001706 dn1_1_First_Result_Fetch: 0.004224 dn1_1_Last_Result_Fetch: 0.001213 Write_Client: 0.001384
SET timestamp=1535017210821;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:12.061000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.036952 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001111 Prepare_Push: 0.001132 dn1_First_Result_Fetch: 0.034266 dn1_Last_Result_Fetch: 0.000084 Write_Client: 0.000443
SET timestamp=1535017212061;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:12.091000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.028213 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000666 Prepare_Push: 0.001206 dn2_First_Result_Fetch: 0.025991 dn2_Last_Result_Fetch: 0.000101 Write_Client: 0.000349
SET timestamp=1535017212091;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:12.132000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.040365 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000223 Prepare_Push: 0.001172 dn2_First_Result_Fetch: 0.019852 dn1_First_Result_Fetch: 0.019810 dn2_Last_Result_Fetch: 0.000901 dn1_Last_Result_Fetch: 0.000780 Write_Client: 0.019160
SET timestamp=1535017212132;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:12.145000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.012196 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000115 Prepare_Push: 0.001403 dn1_0_First_Result_Fetch: 0.006714 dn1_0_Last_Result_Fetch: 0.002561 dn2_0_First_Result_Fetch: 0.006787 dn2_0_Last_Result_Fetch: 0.001806 Write_Client: 0.002280
SET timestamp=1535017212145;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:12.164000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.016979 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000224 Prepare_Push: 0.002236 dn1_0_First_Result_Fetch: 0.006678 dn1_0_Last_Result_Fetch: 0.000703 Generate_New_Query: 0.000866 dn1_1_First_Result_Fetch: 0.004532 dn1_1_Last_Result_Fetch: 0.000879 Write_Client: 0.001002
SET timestamp=1535017212164;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:13.134000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.010213 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000145 Prepare_Push: 0.001520 dn1_First_Result_Fetch: 0.007996 dn1_Last_Result_Fetch: 0.000201 Write_Client: 0.000551
SET timestamp=1535017213134;
select * from sharding_two_node where id =1;
# Time: 2018-08-23T17:40:13.153000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.014257 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000080 Prepare_Push: 0.002394 dn2_First_Result_Fetch: 0.008839 dn1_First_Result_Fetch: 0.008837 dn2_Last_Result_Fetch: 0.001424 dn1_Last_Result_Fetch: 0.002407 Write_Client: 0.002945
SET timestamp=1535017213153;
select * from sharding_two_node;
# Time: 2018-08-23T17:40:13.212000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.029822 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000063 Prepare_Push: 0.001128 dn1_First_Result_Fetch: 0.028277 dn1_Last_Result_Fetch: 0.000109 Write_Client: 0.000355
SET timestamp=1535017213212;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:13.240000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.027695 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000067 Prepare_Push: 0.000682 dn2_First_Result_Fetch: 0.026582 dn2_Last_Result_Fetch: 0.000078 Write_Client: 0.000364
SET timestamp=1535017213240;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:13.321000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.076093 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000231 Prepare_Push: 0.001334 dn2_First_Result_Fetch: 0.035072 dn1_First_Result_Fetch: 0.035074 dn2_Last_Result_Fetch: 0.018756 dn1_Last_Result_Fetch: 0.001263 Write_Client: 0.039457
SET timestamp=1535017213321;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:13.348000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2

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# Query_time: 0.026278 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000335 Prepare_Push: 0.001249 dn1_0_First_Result
_Fetch: 0.011028 dn1_0_Last_Result_Fetch: 0.009279 dn2_0_First_Result_Fetch: 0.019200 dn2_0_Last_Result_Fetch: 0.003441 Write_Client:
0.004600
SET timestamp=1535017213348;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:13.381000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.029152 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000662 Prepare_Push: 0.003189 dn1_0_First_Result
_Fetch: 0.014453 dn1_0_Last_Result_Fetch: 0.001013 Generate_New_Query: 0.000911 dn1_1_First_Result_Fetch: 0.005703 dn1_1_Last_Result_F
etch: 0.001483 Write_Client: 0.002114
SET timestamp=1535017213381;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:14.163000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.012540 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000197 Prepare_Push: 0.001303 dn2_First_Result_F
etch: 0.006452 dn1_First_Result_Fetch: 0.007858 dn2_Last_Result_Fetch: 0.004065 dn1_Last_Result_Fetch: 0.002960 Write_Client: 0.004588
SET timestamp=1535017214163;
select * from sharding_two_node;
# Time: 2018-08-23T17:40:14.220000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.027587 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000051 Prepare_Push: 0.000744 dn1_First_Result_F
etch: 0.026441 dn1_Last_Result_Fetch: 0.000104 Write_Client: 0.000350
SET timestamp=1535017214220;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:14.253000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.031984 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000070 Prepare_Push: 0.001144 dn2_First_Result_F
etch: 0.030202 dn2_Last_Result_Fetch: 0.000182 Write_Client: 0.000568
SET timestamp=1535017214253;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:14.292000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.037327 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000272 Prepare_Push: 0.001316 dn2_First_Result_F
etch: 0.014299 dn1_First_Result_Fetch: 0.014331 dn2_Last_Result_Fetch: 0.001148 dn1_Last_Result_Fetch: 0.000753 Write_Client: 0.021440
SET timestamp=1535017214292;
insert into sharding_two_node values(15, '15', 15), (519, '519', 519);
# Time: 2018-08-23T17:40:14.303000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.010244 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000050 Prepare_Push: 0.001101 dn1_0_First_Result
_Fetch: 0.004540 dn1_0_Last_Result_Fetch: 0.002781 dn2_0_First_Result_Fetch: 0.004708 dn2_0_Last_Result_Fetch: 0.002592 Write_Client:
0.002092
SET timestamp=1535017214303;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:14.327000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.021078 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000109 Prepare_Push: 0.002098 dn1_0_First_Result
_Fetch: 0.006720 dn1_0_Last_Result_Fetch: 0.000748 Generate_New_Query: 0.001158 dn1_1_First_Result_Fetch: 0.008043 dn1_1_Last_Result_F
etch: 0.001147 Write_Client: 0.001269
SET timestamp=1535017214327;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:15.254000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.010569 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000076 Prepare_Push: 0.001050 dn1_First_Result_F
etch: 0.008330 dn1_Last_Result_Fetch: 0.000146 Write_Client: 0.001113
SET timestamp=1535017215254;
select * from sharding_two_node where id =1;
# Time: 2018-08-23T17:40:15.321000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.024216 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000081 Prepare_Push: 0.001295 dn1_First_Result_F
etch: 0.021938 dn1_Last_Result_Fetch: 0.000422 Write_Client: 0.000902
SET timestamp=1535017215321;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:15.351000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.027796 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000666 Prepare_Push: 0.000760 dn2_First_Result_F
etch: 0.025984 dn2_Last_Result_Fetch: 0.000094 Write_Client: 0.000386
SET timestamp=1535017215351;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:15.392000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.039805 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000217 Prepare_Push: 0.000804 dn2_First_Result_F
etch: 0.017410 dn1_First_Result_Fetch: 0.017468 dn2_Last_Result_Fetch: 0.001490 dn1_Last_Result_Fetch: 0.001223 Write_Client: 0.021374
SET timestamp=1535017215392;
insert into sharding_two_node values(15, '15', 15), (519, '519', 519);
# Time: 2018-08-23T17:40:15.410000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.017384 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000152 Prepare_Push: 0.001183 dn1_0_First_Result
_Fetch: 0.005037 dn1_0_Last_Result_Fetch: 0.007164 dn2_0_First_Result_Fetch: 0.008156 dn2_0_Last_Result_Fetch: 0.004962 Write_Client:

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0.004043
SET timestamp=1535017215410;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:15.434000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.021341 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000318 Prepare_Push: 0.002764 dn1_0_First_Result_Fetch: 0.010897 dn1_0_Last_Result_Fetch: 0.000544 Generate_New_Query: 0.000798 dn1_1_First_Result_Fetch: 0.004506 dn1_1_Last_Result_Fetch: 0.000790 Write_Client: 0.000845
SET timestamp=1535017215434;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:16.322000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.030106 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000217 Prepare_Push: 0.001253 dn1_First_Result_Fetch: 0.028330 dn1_Last_Result_Fetch: 0.000086 Write_Client: 0.000306
SET timestamp=1535017216322;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:16.353000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.030005 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001306 Prepare_Push: 0.001004 dn2_First_Result_Fetch: 0.027242 dn2_Last_Result_Fetch: 0.000140 Write_Client: 0.000453
SET timestamp=1535017216353;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:16.403000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.049615 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001459 Prepare_Push: 0.000830 dn2_First_Result_Fetch: 0.024286 dn1_First_Result_Fetch: 0.025469 dn2_Last_Result_Fetch: 0.001726 dn1_Last_Result_Fetch: 0.000853 Write_Client: 0.023039
SET timestamp=1535017216403;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:16.526000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.121702 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000337 Prepare_Push: 0.000889 dn1_0_First_Result_Fetch: 0.009370 dn1_0_Last_Result_Fetch: 0.002010 dn2_0_First_Result_Fetch: 0.009160 dn2_0_Last_Result_Fetch: 0.001779 Write_Client: 0.109753
SET timestamp=1535017216526;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:16.560000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.030306 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001534 Prepare_Push: 0.001759 dn1_0_First_Result_Fetch: 0.011846 dn1_0_Last_Result_Fetch: 0.001663 Generate_New_Query: 0.003223 dn1_1_First_Result_Fetch: 0.006428 dn1_1_Last_Result_Fetch: 0.002601 Write_Client: 0.002291
SET timestamp=1535017216560;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:17.325000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.017545 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.006231 Prepare_Push: 0.002335 dn1_First_Result_Fetch: 0.008121 dn1_Last_Result_Fetch: 0.000277 Write_Client: 0.000857
SET timestamp=1535017217325;
select * from sharding_two_node where id =1;
# Time: 2018-08-23T17:40:17.390000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.026216 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000854 Prepare_Push: 0.000904 dn1_First_Result_Fetch: 0.024157 dn1_Last_Result_Fetch: 0.000081 Write_Client: 0.000301
SET timestamp=1535017217390;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:17.411000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.020095 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000699 Prepare_Push: 0.000711 dn2_First_Result_Fetch: 0.017634 dn2_Last_Result_Fetch: 0.000132 Write_Client: 0.001051
SET timestamp=1535017217411;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:17.491000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.078505 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001702 Prepare_Push: 0.000763 dn2_First_Result_Fetch: 0.018547 dn1_First_Result_Fetch: 0.018482 dn2_Last_Result_Fetch: 0.036637 dn1_Last_Result_Fetch: 0.000566 Write_Client: 0.057558
SET timestamp=1535017217491;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:17.518000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.026112 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000686 Prepare_Push: 0.000872 dn1_0_First_Result_Fetch: 0.007054 dn1_0_Last_Result_Fetch: 0.001072 dn2_0_First_Result_Fetch: 0.005839 dn2_0_Last_Result_Fetch: 0.017248 Write_Client: 0.016586
SET timestamp=1535017217518;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:17.558000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.038199 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000966 Prepare_Push: 0.005189 dn1_0_First_Result_Fetch: 0.013137 dn1_0_Last_Result_Fetch: 0.001134 Generate_New_Query: 0.003973 dn1_1_First_Result_Fetch: 0.010228 dn1_1_Last_Result_Fetch: 0.003564 Write_Client: 0.002115

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SET timestamp=1535017217558;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:18.353000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.019048 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.003008 Prepare_Push: 0.000844 dn2_First_Result_Fetch: 0.006415 dn1_First_Result_Fetch: 0.009082 dn2_Last_Result_Fetch: 0.000323 dn1_Last_Result_Fetch: 0.005902 Write_Client: 0.008781
SET timestamp=1535017218353;
select * from sharding_two_node;
# Time: 2018-08-23T17:40:18.410000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.025498 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000060 Prepare_Push: 0.000696 dn1_First_Result_Fetch: 0.024394 dn1_Last_Result_Fetch: 0.000084 Write_Client: 0.000348
SET timestamp=1535017218410;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:18.430000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.018794 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000047 Prepare_Push: 0.001301 dn2_First_Result_Fetch: 0.017073 dn2_Last_Result_Fetch: 0.000099 Write_Client: 0.000373
SET timestamp=1535017218430;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:18.471000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.039810 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000052 Prepare_Push: 0.000661 dn2_First_Result_Fetch: 0.019799 dn1_First_Result_Fetch: 0.019923 dn2_Last_Result_Fetch: 0.000698 dn1_Last_Result_Fetch: 0.000814 Write_Client: 0.019298
SET timestamp=1535017218471;
insert into sharding_two_node values(15, '15', 15), (519, '519', 519);
# Time: 2018-08-23T17:40:18.484000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.012214 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000047 Prepare_Push: 0.001782 dn1_0_First_Result_Fetch: 0.007109 dn1_0_Last_Result_Fetch: 0.001544 dn2_0_First_Result_Fetch: 0.005518 dn2_0_Last_Result_Fetch: 0.001470 Write_Client: 0.003568
SET timestamp=1535017218484;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:18.507000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.019695 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000046 Prepare_Push: 0.001448 dn1_0_First_Result_Fetch: 0.006244 dn1_0_Last_Result_Fetch: 0.000988 Generate_New_Query: 0.001564 dn1_1_First_Result_Fetch: 0.007080 dn1_1_Last_Result_Fetch: 0.001306 Write_Client: 0.001137
SET timestamp=1535017218507;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:19.351000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.020937 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000059 Prepare_Push: 0.000800 dn1_First_Result_Fetch: 0.019607 dn1_Last_Result_Fetch: 0.000169 Write_Client: 0.000472
SET timestamp=1535017219351;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:19.370000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.018011 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001184 Prepare_Push: 0.000583 dn2_First_Result_Fetch: 0.015894 dn2_Last_Result_Fetch: 0.000129 Write_Client: 0.000351
SET timestamp=1535017219370;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:19.412000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.041319 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000689 Prepare_Push: 0.000573 dn2_First_Result_Fetch: 0.017735 dn1_First_Result_Fetch: 0.017876 dn2_Last_Result_Fetch: 0.000601 dn1_Last_Result_Fetch: 0.000806 Write_Client: 0.022322
SET timestamp=1535017219412;
insert into sharding_two_node values(15, '15', 15), (519, '519', 519);
# Time: 2018-08-23T17:40:19.423000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.010063 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000200 Prepare_Push: 0.001136 dn1_0_First_Result_Fetch: 0.006820 dn1_0_Last_Result_Fetch: 0.000694 dn2_0_First_Result_Fetch: 0.003519 dn2_0_Last_Result_Fetch: 0.003944 Write_Client: 0.001443
SET timestamp=1535017219423;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:19.454000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.027592 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000182 Prepare_Push: 0.012798 dn1_0_First_Result_Fetch: 0.005960 dn1_0_Last_Result_Fetch: 0.000530 Generate_New_Query: 0.000811 dn1_1_First_Result_Fetch: 0.005659 dn1_1_Last_Result_Fetch: 0.000926 Write_Client: 0.001101
SET timestamp=1535017219454;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:20.312000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.025903 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001470 Prepare_Push: 0.000887 dn1_First_Result_Fetch: 0.022114 dn1_Last_Result_Fetch: 0.000197 Write_Client: 0.001433
SET timestamp=1535017220312;
delete from sharding_two_node where id =15;

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# Time: 2018-08-23T17:40:20.342000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.028503 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.005643 Prepare_Push: 0.001172 dn2_First_Result_Fetch: 0.021342 dn2_Last_Result_Fetch: 0.000074 Write_Client: 0.000346
SET timestamp=1535017220342;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:20.381000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.037424 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000641 Prepare_Push: 0.000959 dn2_First_Result_Fetch: 0.015139 dn1_First_Result_Fetch: 0.015238 dn2_Last_Result_Fetch: 0.000795 dn1_Last_Result_Fetch: 0.000956 Write_Client: 0.020685
SET timestamp=1535017220381;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:20.408000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.016143 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000122 Prepare_Push: 0.001979 dn1_0_First_Result_Fetch: 0.004408 dn1_0_Last_Result_Fetch: 0.000484 Generate_New_Query: 0.000965 dn1_1_First_Result_Fetch: 0.006059 dn1_1_Last_Result_Fetch: 0.001553 Write_Client: 0.000755
SET timestamp=1535017220408;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:21.214000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.023376 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000073 Prepare_Push: 0.001306 dn1_First_Result_Fetch: 0.021694 dn1_Last_Result_Fetch: 0.000081 Write_Client: 0.000302
SET timestamp=1535017221214;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:21.241000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.025408 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000083 Prepare_Push: 0.001029 dn2_First_Result_Fetch: 0.023856 dn2_Last_Result_Fetch: 0.000122 Write_Client: 0.000440
SET timestamp=1535017221241;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:21.281000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.038482 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000087 Prepare_Push: 0.000871 dn2_First_Result_Fetch: 0.016690 dn1_First_Result_Fetch: 0.016708 dn2_Last_Result_Fetch: 0.000579 dn1_Last_Result_Fetch: 0.000891 Write_Client: 0.020835
SET timestamp=1535017221281;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:21.293000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.011657 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000615 Prepare_Push: 0.001320 dn1_0_First_Result_Fetch: 0.006906 dn1_0_Last_Result_Fetch: 0.001589 dn2_0_First_Result_Fetch: 0.005105 dn2_0_Last_Result_Fetch: 0.001548 Write_Client: 0.003341
SET timestamp=1535017221293;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:21.312000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.017169 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000635 Prepare_Push: 0.001609 dn1_0_First_Result_Fetch: 0.006997 dn1_0_Last_Result_Fetch: 0.000728 Generate_New_Query: 0.001037 dn1_1_First_Result_Fetch: 0.004816 dn1_1_Last_Result_Fetch: 0.000709 Write_Client: 0.000703
SET timestamp=1535017221312;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:22.150000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.026153 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000180 Prepare_Push: 0.000771 dn1_First_Result_Fetch: 0.024940 dn1_Last_Result_Fetch: 0.000061 Write_Client: 0.000261
SET timestamp=1535017222150;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:22.170000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.019181 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000180 Prepare_Push: 0.000642 dn2_First_Result_Fetch: 0.018060 dn2_Last_Result_Fetch: 0.000088 Write_Client: 0.000299
SET timestamp=1535017222170;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:22.220000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.049834 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000261 Prepare_Push: 0.000735 dn2_First_Result_Fetch: 0.019862 dn1_First_Result_Fetch: 0.019807 dn2_Last_Result_Fetch: 0.000418 dn1_Last_Result_Fetch: 0.000655 Write_Client: 0.029031
SET timestamp=1535017222220;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:22.240000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.019128 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000934 Prepare_Push: 0.002731 dn1_0_First_Result_Fetch: 0.013430 dn1_0_Last_Result_Fetch: 0.000521 dn2_0_First_Result_Fetch: 0.003296 dn2_0_Last_Result_Fetch: 0.001243 Write_Client: 0.011072
SET timestamp=1535017222240;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:22.270000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2

```

```

# Query_time: 0.028479 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.003233 Prepare_Push: 0.004986 dn1_0_First_Result
_Fetch: 0.009870 dn1_0_Last_Result_Fetch: 0.001172 Generate_New_Query: 0.001590 dn1_1_First_Result_Fetch: 0.006060 dn1_1_Last_Result_F
etch: 0.000771 Write_Client: 0.000700
SET timestamp=1535017222270;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:23.097000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.053956 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000056 Prepare_Push: 0.001034 dn1_First_Result_F
etch: 0.052343 dn1_Last_Result_Fetch: 0.000174 Write_Client: 0.000523
SET timestamp=1535017223097;
select * from sharding_two_node where id =1;
# Time: 2018-08-23T17:40:23.110000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.010839 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000499 Prepare_Push: 0.000680 dn2_First_Result_F
etch: 0.006349 dn1_First_Result_Fetch: 0.009082 dn2_Last_Result_Fetch: 0.000270 dn1_Last_Result_Fetch: 0.000333 Write_Client: 0.003311
SET timestamp=1535017223110;
select * from sharding_two_node;
# Time: 2018-08-23T17:40:23.181000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.027573 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000109 Prepare_Push: 0.000980 dn2_First_Result_F
etch: 0.026156 dn2_Last_Result_Fetch: 0.000086 Write_Client: 0.000328
SET timestamp=1535017223181;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:23.231000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.049380 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.002435 Prepare_Push: 0.000670 dn2_First_Result_F
etch: 0.025278 dn1_First_Result_Fetch: 0.025242 dn2_Last_Result_Fetch: 0.000392 dn1_Last_Result_Fetch: 0.000629 Write_Client: 0.021032
SET timestamp=1535017223231;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:23.268000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.025207 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000060 Prepare_Push: 0.001492 dn1_0_First_Result
_Fetch: 0.007693 dn1_0_Last_Result_Fetch: 0.000752 Generate_New_Query: 0.001946 dn1_1_First_Result_Fetch: 0.008776 dn1_1_Last_Result_F
etch: 0.005040 Write_Client: 0.001884
SET timestamp=1535017223268;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:24.121000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.027104 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001558 Prepare_Push: 0.001107 dn1_First_Result_F
etch: 0.024084 dn1_Last_Result_Fetch: 0.000085 Write_Client: 0.000356
SET timestamp=1535017224121;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:24.141000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.019191 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000072 Prepare_Push: 0.000673 dn2_First_Result_F
etch: 0.017923 dn2_Last_Result_Fetch: 0.000092 Write_Client: 0.000522
SET timestamp=1535017224141;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:24.182000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.039883 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000483 Prepare_Push: 0.000584 dn2_First_Result_F
etch: 0.017241 dn1_First_Result_Fetch: 0.017320 dn2_Last_Result_Fetch: 0.000603 dn1_Last_Result_Fetch: 0.000767 Write_Client: 0.021575
SET timestamp=1535017224182;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:24.196000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.012406 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000073 Prepare_Push: 0.000958 dn1_0_First_Result
_Fetch: 0.008102 dn1_0_Last_Result_Fetch: 0.001255 dn2_0_First_Result_Fetch: 0.007566 dn2_0_Last_Result_Fetch: 0.001772 Write_Client:
0.002300
SET timestamp=1535017224196;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:24.218000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.021238 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000864 Prepare_Push: 0.001143 dn1_0_First_Result
_Fetch: 0.010305 dn1_0_Last_Result_Fetch: 0.000532 Generate_New_Query: 0.001852 dn1_1_First_Result_Fetch: 0.005359 dn1_1_Last_Result_F
etch: 0.000618 Write_Client: 0.000661
SET timestamp=1535017224218;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:25.093000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.029579 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000106 Prepare_Push: 0.000882 dn1_First_Result_F
etch: 0.028241 dn1_Last_Result_Fetch: 0.000069 Write_Client: 0.000351
SET timestamp=1535017225093;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:25.121000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.027422 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001867 Prepare_Push: 0.001330 dn2_First_Result_F
etch: 0.023887 dn2_Last_Result_Fetch: 0.000102 Write_Client: 0.000338

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SET timestamp=1535017225121;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:25.161000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.038859 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000050 Prepare_Push: 0.000753 dn2_First_Result_Fetch: 0.019091 dn1_First_Result_Fetch: 0.019189 dn2_Last_Result_Fetch: 0.000582 dn1_Last_Result_Fetch: 0.000560 Write_Client: 0.018965
SET timestamp=1535017225161;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:25.191000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.016379 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000043 Prepare_Push: 0.001276 dn1_0_First_Result_Fetch: 0.007469 dn1_0_Last_Result_Fetch: 0.000678 Generate_New_Query: 0.001327 dn1_1_First_Result_Fetch: 0.003927 dn1_1_Last_Result_Fetch: 0.000787 Write_Client: 0.000893
SET timestamp=1535017225191;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:26.026000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.029878 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000162 Prepare_Push: 0.000916 dn1_First_Result_Fetch: 0.028497 dn1_Last_Result_Fetch: 0.000084 Write_Client: 0.000303
SET timestamp=1535017226026;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:26.051000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.024231 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001105 Prepare_Push: 0.000469 dn2_First_Result_Fetch: 0.022188 dn2_Last_Result_Fetch: 0.000100 Write_Client: 0.000470
SET timestamp=1535017226051;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:26.091000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.039762 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.001669 Prepare_Push: 0.001915 dn2_First_Result_Fetch: 0.018107 dn1_First_Result_Fetch: 0.018187 dn2_Last_Result_Fetch: 0.000633 dn1_Last_Result_Fetch: 0.000832 Write_Client: 0.018071
SET timestamp=1535017226091;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:26.105000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.012664 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000261 Prepare_Push: 0.000935 dn1_0_First_Result_Fetch: 0.007328 dn1_0_Last_Result_Fetch: 0.000733 dn2_0_First_Result_Fetch: 0.006229 dn2_0_Last_Result_Fetch: 0.002592 Write_Client: 0.003554
SET timestamp=1535017226105;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:26.134000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.028335 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000046 Prepare_Push: 0.003442 dn1_0_First_Result_Fetch: 0.009563 dn1_0_Last_Result_Fetch: 0.001069 Generate_New_Query: 0.001856 dn1_1_First_Result_Fetch: 0.010875 dn1_1_Last_Result_Fetch: 0.000798 Write_Client: 0.000712
SET timestamp=1535017226134;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
# Time: 2018-08-23T17:40:26.859000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.014882 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000067 Prepare_Push: 0.001351 dn1_First_Result_Fetch: 0.013084 dn1_Last_Result_Fetch: 0.000137 Write_Client: 0.000381
SET timestamp=1535017226859;
select * from sharding_two_node where id =1;
# Time: 2018-08-23T17:40:26.874000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.010509 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000066 Prepare_Push: 0.001761 dn2_First_Result_Fetch: 0.006921 dn1_First_Result_Fetch: 0.008256 dn2_Last_Result_Fetch: 0.000279 dn1_Last_Result_Fetch: 0.000211 Write_Client: 0.001761
SET timestamp=1535017226874;
select * from sharding_two_node;
# Time: 2018-08-23T17:40:26.931000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.028690 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000237 Prepare_Push: 0.001126 dn1_First_Result_Fetch: 0.026194 dn1_Last_Result_Fetch: 0.000640 Write_Client: 0.001133
SET timestamp=1535017226931;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:26.951000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.018818 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000342 Prepare_Push: 0.001671 dn2_First_Result_Fetch: 0.016482 dn2_Last_Result_Fetch: 0.000063 Write_Client: 0.000323
SET timestamp=1535017226951;
delete from sharding_two_node where id =519;
# Time: 2018-08-23T17:40:26.991000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.039399 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000082 Prepare_Push: 0.000706 dn2_First_Result_Fetch: 0.019233 dn1_First_Result_Fetch: 0.019167 dn2_Last_Result_Fetch: 0.000426 dn1_Last_Result_Fetch: 0.000739 Write_Client: 0.019444
SET timestamp=1535017226991;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:27.032000Z

```

```
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
# Query_time: 0.029495 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.000064 Prepare_Push: 0.001349 dn1_0_First_Result
_fetch: 0.005745 dn1_0_Last_Result_Fetch: 0.000632 Generate_New_Query: 0.001056 dn1_1_First_Result_Fetch: 0.018101 dn1_1_Last_Result_F
etch: 0.002282 Write_Client: 0.000863
SET timestamp=1535017227032;
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
```

2.20.3.1 mysqldumpslow :

```
Reading mysql slow query log from /tmp/slow3.log
Count: 17 Time=0.05s (0s) Lock=0.00s (0s) Rows=0.0 (0), root[root]@[0:0:0:0:0:0:0:1]
insert into sharding_two_node values(N,'S',N),(N,'S',N)

Count: 13 Time=0.05s (0s) Lock=0.00s (0s) Rows=0.0 (0), root[root]@[0:0:0:0:0:0:0:1]
select count(*) from sharding_two_node

Count: 6 Time=0.04s (0s) Lock=0.00s (0s) Rows=0.0 (0), root[root]@[0:0:0:0:0:0:0:1]
select * from sharding_two_node where id =N

Count: 33 Time=0.03s (0s) Lock=0.00s (0s) Rows=0.0 (0), root[root]@[0:0:0:0:0:0:0:1]
delete from sharding_two_node where id =N

Count: 17 Time=0.03s (0s) Lock=0.00s (0s) Rows=0.0 (0), root[root]@[0:0:0:0:0:0:0:1]
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=N)

Count: 6 Time=0.02s (0s) Lock=0.00s (0s) Rows=0.0 (0), root[root]@[0:0:0:0:0:0:0:1]
select * from sharding_two_node
```

2.20.3.2 pt-query-digest :

```
# 710ms user time, 70ms system time, 23.35M rss, 68.36M vsz
# Current date: Thu Aug 23 17:48:25 2018
# Hostname: 10-186-24-63
# Files: /tmp/slow_query4.log
# Overall: 92 total, 6 unique, 5.41 QPS, 0.18x concurrency _____
# Time range: 2018-08-23T17:40:10 to 2018-08-23T17:40:27
# Attribute      total     min      max      avg     95%    stddev   median
# ====== ====== ====== ====== ====== ====== ====== ======
# Exec time       3s    10ms   339ms   34ms    75ms   37ms    27ms
# Lock time       0      0      0      0      0      0      0
# Rows sent       0      0      0      0      0      0      0
# Rows examine    0      0      0      0      0      0      0
# Query size    4.91k    31      94    54.64   92.72   20.87   42.48
# Generate New   0.03    0.00    0.00    0.00    0.00    0.00    0.00
# Prepare Push   0.56    0.00    0.26    0.01    0.01    0.03    0.00
# Read SQL       0.07    0.00    0.01    0.00    0.00    0.00    0.00
# Write Client   0.70    0.00    0.11    0.01    0.02    0.01    0.00
# dn1 0 First   0.29    0.00    0.05    0.01    0.01    0.01    0.01
# dn1 0 Last R  0.07    0.00    0.03    0.00    0.01    0.01    0.00
# dn1 1 First R 0.12    0.00    0.02    0.01    0.01    0.00    0.01
# dn1 1 Last R  0.03    0.00    0.01    0.00    0.00    0.00    0.00
# dn1 First Re  0.93    0.01    0.05    0.02    0.03    0.01    0.02
# dn1 Last Res  0.04    0.00    0.01    0.00    0.00    0.00    0.00
# dn2 0 First   0.13    0.00    0.04    0.01    0.02    0.01    0.01
# dn2 0 Last R  0.08    0.00    0.03    0.01    0.02    0.01    0.00
# dn2 First Re  0.80    0.01    0.06    0.02    0.03    0.01    0.02
# dn2 Last Res  0.09    0.00    0.04    0.00    0.01    0.01    0.00

# Profile
# Rank Query ID          Response time Calls R/Call V/M   I
# ===== ====== ====== ====== ====== ====== ====== =====
# 1 0x13233F8ADA41C6E2D889AEE0C2B... 0.8815 28.1%   33 0.0267  0.00 DELETE sharding_two_node
# 2 0xF68D16B46E487184E8FD3BB3912... 0.8525 27.1%   17 0.0501  0.01 INSERT sharding_two_node
# 3 0xB46D813C53609C853F7CBA6D2DB... 0.6306 20.1%   13 0.0485  0.15 SELECT sharding_two_node
# 4 0x3FB41587E746A475282C1ED2606... 0.4335 13.8%   17 0.0255  0.00 SELECT sharding_two_node
# 5 0x04CDF91DDFC4E1DD7A22E312C72... 0.2399  7.6%    6 0.0400  0.05 SELECT sharding_two_node
# MISC 0xMISC           0.1028  3.3%    6 0.0171  0.0 <1 ITEMS>

# Query 1: 2.06 QPS, 0.06x concurrency, ID 0x13233F8ADA41C6E2D889AEE0C2BC6CB5 at byte 943
# Scores: V/M = 0.00
# Time range: 2018-08-23T17:40:10 to 2018-08-23T17:40:26
# Attribute      pct      total      min      max      avg     95%    stddev   median
# ====== ====== ====== ====== ====== ====== ====== ======
# Count         35        33      18ms     45ms    27ms    31ms     5ms    27ms
# Exec time     28     882ms    18ms     45ms    27ms    31ms     5ms    27ms
```

```

# Lock time      0      0      0      0      0      0      0      0      0
# Rows sent      0      0      0      0      0      0      0      0      0
# Rows examine   0      0      0      0      0      0      0      0      0
# Query size    27    1.37k     42     43    42.52    42.48     0.50    42.48
# Prepare Push   6     0.04    0.00    0.00    0.00    0.00    0.00    0.00    0.00
# Read SQL      35     0.03    0.00    0.01    0.00    0.00    0.00    0.00    0.00
# Write Client   2     0.02    0.00    0.00    0.00    0.00    0.00    0.00    0.00
# dn1 First Re  45     0.42    0.02    0.04    0.03    0.03    0.01    0.01    0.03
# dn1 Last Res  7     0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
# dn2 First Re  47     0.38    0.02    0.03    0.02    0.03    0.00    0.00    0.02
# dn2 Last Res  3     0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
# String:
# Hosts          0:0:0:0:0:0:0:1
# Users          root
# Query_time distribution
#   1us
#  10us
# 100us
#   1ms
# 10ms #####
# 100ms #####
#   1s
# 10s+
# Tables
#   SHOW TABLE STATUS LIKE 'sharding_two_node'\G
#   SHOW CREATE TABLE `sharding_two_node`\G
delete from sharding_two_node where id =15\G
# Converted for EXPLAIN
# EXPLAIN /*!50100 PARTITIONS*/
select * from sharding_two_node where id =15\G

# Query 2: 1.06 QPS, 0.05x concurrency, ID 0xF68D16B46E487184E8FD3BB3912A3658 at byte 1690
# Scores: V/M = 0.01
# Time range: 2018-08-23T17:40:10 to 2018-08-23T17:40:26
# Attribute  pct  total    min     max     avg    95%  stddev  median
# ======  ===  =====  =====  =====  =====  =====  =====  =====
# Count      18     17
# Exec time  27   853ms   37ms   117ms   50ms   78ms   21ms   40ms
# Lock time  0      0      0      0      0      0      0      0      0
# Rows sent  0      0      0      0      0      0      0      0      0
# Rows examine  0      0      0      0      0      0      0      0      0
# Query size 21    1.06k    64      64      64      64      0      64
# Prepare Push 7     0.04    0.00    0.02    0.00    0.00    0.01    0.00
# Read SQL   32     0.02    0.00    0.01    0.00    0.00    0.00    0.00    0.00
# Write Client 63     0.45    0.02    0.06    0.03    0.05    0.01    0.02
# dn1 First Re 37     0.35    0.01    0.04    0.02    0.03    0.00    0.02
# dn1 Last Res 40     0.01    0.00    0.00    0.00    0.00    0.00    0.00    0.00
# dn2 First Re 46     0.37    0.01    0.06    0.02    0.03    0.01    0.02
# dn2 Last Res 72     0.07    0.00    0.04    0.00    0.02    0.01    0.00    0.00
# String:
# Hosts          0:0:0:0:0:0:0:1
# Users          root
# Query_time distribution
#   1us
#  10us
# 100us
#   1ms
# 10ms #####
# 100ms #####
#   1s
# 10s+
# Tables
#   SHOW TABLE STATUS LIKE 'sharding_two_node'\G
#   SHOW CREATE TABLE `sharding_two_node`\G
insert into sharding_two_node values(15,'15',15) /*... omitted ...*/\G

# Query 3: 0.81 QPS, 0.04x concurrency, ID 0xB46D813C53609C853F7CBA6D2DB4047C at byte 2152
# Scores: V/M = 0.15
# Time range: 2018-08-23T17:40:10 to 2018-08-23T17:40:26
# Attribute  pct  total    min     max     avg    95%  stddev  median
# ======  ===  =====  =====  =====  =====  =====  =====  =====
# Count      14     13
# Exec time  20   631ms   10ms   339ms   49ms   116ms   84ms   12ms
# Lock time  0      0      0      0      0      0      0      0      0
# Rows sent  0      0      0      0      0      0      0      0      0
# Rows examine  0      0      0      0      0      0      0      0      0
# Query size  9     494     38      38      38      38      0      38
# Prepare Push 48     0.27    0.00    0.26    0.02    0.00    0.07    0.00

```

```

# Read SQL      5  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
# Write Client 24  0.17  0.00  0.11  0.01  0.02  0.03  0.00
# dn1 0 First  48  0.14  0.00  0.05  0.01  0.01  0.01  0.01
# dn1 0 Last R 80  0.06  0.00  0.03  0.00  0.01  0.01  0.00
# dn2 0 First 100  0.13  0.00  0.04  0.01  0.02  0.01  0.01
# dn2 0 Last R 100  0.08  0.00  0.03  0.01  0.02  0.01  0.00
# String:
# Hosts        0:0:0:0:0:0:0:1
# Users        root
# Query_time distribution
#   1us
#  10us
# 100us
#  1ms
# 10ms #####
# 100ms #####
#   1s
# 10s+
# Tables
#   SHOW TABLE STATUS LIKE 'sharding_two_node'\G
#   SHOW CREATE TABLE `sharding_two_node`\G
# EXPLAIN /*!50100 PARTITIONS*/
select count(*) from sharding_two_node\G

# Query 4: 1 QPS, 0.03x concurrency, ID 0x3FB41587E746A475282C1ED2606795FB at byte 2596
# Scores: V/M = 0.00
# Time range: 2018-08-23T17:40:10 to 2018-08-23T17:40:27
# Attribute  pct  total    min     max     avg    95%  stddev median
# ====== ==  =====  =====  =====  =====  =====  =====  =====
# Count      18    17
# Exec time  13  434ms   16ms   47ms   26ms   38ms   8ms   26ms
# Lock time  0    0       0       0       0       0       0       0
# Rows sent  0    0       0       0       0       0       0       0
# Rows examine 0    0       0       0       0       0       0       0
# Query size 31  1.56k   94     94     94     94     0       94
# Generate New 100  0.03  0.00  0.00  0.00  0.00  0.00  0.00  0.00
# Prepare Push 13  0.07  0.00  0.03  0.00  0.01  0.01  0.00
# Read SQL    12  0.01  0.00  0.00  0.00  0.00  0.00  0.00
# Write Client 2  0.02  0.00  0.00  0.00  0.00  0.00  0.00
# dn1 0 First 51  0.15  0.00  0.01  0.01  0.01  0.00  0.01
# dn1 0 Last R 19  0.01  0.00  0.00  0.00  0.00  0.00  0.00
# dn1 1 First 100  0.12  0.00  0.02  0.01  0.01  0.00  0.01
# dn1 1 Last R 100  0.03  0.00  0.01  0.00  0.00  0.00  0.00
# String:
# Hosts        0:0:0:0:0:0:0:1
# Users        root
# Query_time distribution
#   1us
#  10us
# 100us
#  1ms
# 10ms #####
# 100ms #####
#   1s
# 10s+
# Tables
#   SHOW TABLE STATUS LIKE 'sharding_two_node'\G
#   SHOW CREATE TABLE `sharding_two_node`\G
# EXPLAIN /*!50100 PARTITIONS*/
select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1)\G

# Query 5: 0.38 QPS, 0.01x concurrency, ID 0x04CDF91DDFC4E1DD7A22E312C72C268D at byte 0
# Scores: V/M = 0.05
# Time range: 2018-08-23T17:40:10 to 2018-08-23T17:40:26
# Attribute  pct  total    min     max     avg    95%  stddev median
# ====== ==  =====  =====  =====  =====  =====  =====  =====
# Count      6    6
# Exec time  7  240ms   10ms   133ms   40ms   128ms   43ms   35ms
# Lock time  0    0       0       0       0       0       0       0
# Rows sent  0    0       0       0       0       0       0       0
# Rows examine 0    0       0       0       0       0       0       0
# Query size 5  258     43     43     43     43     0       43
# Prepare Push 22  0.12  0.00  0.12  0.02  0.12  0.04  0.00
# Read SQL    9  0.01  0.00  0.01  0.00  0.01  0.00  0.00
# Write Client 0  0.01  0.00  0.00  0.00  0.00  0.00  0.00
# dn1 First Re 11  0.10  0.01  0.05  0.02  0.05  0.02  0.01
# dn1 Last Res 6  0.00  0.00  0.00  0.00  0.00  0.00  0.00
# String:

```

```

# Hosts      0:0:0:0:0:0:0:1
# Users      root
# Query_time distribution
#   1us
# 10us
# 100us
# 1ms
# 10ms #####
# 100ms #####
#   1s
# 10s+
# Tables
#   SHOW TABLE STATUS LIKE 'sharding_two_node'\G
#   SHOW CREATE TABLE `sharding_two_node`\G
# EXPLAIN /*!50100 PARTITIONS*/
select * from sharding_two_node where id =1\G

```

2.20.3.3

mysqldumpslow 5.6 mysqldumpslow '190428 10:28:16' Timedble' 2019-04-28T10:28:16.515000Z' issue:

<https://github.com/actiontech/dble/issues/908>

2.20.4

2.20.4.1 MySQL

MySQL

```

/usr/local/mysql5.7.11/bin/mysqld-debug, Version: 5.7.11-debug-log (MySQL Community Server - Debug (GPL)). started with:

Tcp port: 3320 Unix socket: /tmp/mysql_3320.sock

Time           Id Command    Argument
# Time: 2018-05-15T10:53:23.798040Z
# User@Host: action[action] @ [192.168.2.206]  Id:  436
# Query_time: 296.145816  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0

use test;

SET timestamp=1526381603;

drop table sharding_two_node;

# Time: 2018-05-15T11:32:25.549290Z
# User@Host: action[action] @ [192.168.2.206]  Id:  451
# Query_time: 129.555883  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0

use nosharding;

SET timestamp=1526383945;

drop table test4;

# Time: 2018-05-15T11:32:25.550190Z
# User@Host: action[action] @ [192.168.2.206]  Id:  454
# Query_time: 84.316518  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0

SET timestamp=1526383945;

insert into test4 values(1,'1');

# Time: 2018-05-15T11:37:01.079214Z
# User@Host: action[action] @ [192.168.2.206]  Id:  483
# Query_time: 49.571983  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0

SET timestamp=1526384221;

drop table test3;

```

```
# Time: 2018-07-11T05:28:34.161405Z
# User@Host: action[action] @ [192.168.2.206] Id: 16421
# Query_time: 10.035706 Lock_time: 0.000000 Rows_sent: 1 Rows_examined: 0
use test;
SET timestamp=1531286914;
insert into test4 values(1,'1');
```

MySQL

1.1

/usr/local/mysql5.7.11/bin/mysqld-debug, Version: 5.7.11-debug-log (MySQL Community Server - Debug (GPL)). started with:

Tcp port: 3320 Unix socket: /tmp/mysql_3320.sock

Time Id Command Argument

MySQLlog-short-formattimesession

1.2 time

```
# Time: 2018-05-15T10:53:23.798040Z
```

1.3 session

```
# User@Host: action[action] @ [192.168.2.206] Id: 436
```

1.4

keyvalue

```
# Query_time: 296.145816 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0
```

1.5 Database changeschema

```
use nosharding;
```

1.6 set(mysql dump slow SET timestamp=)

```
SET timestamp=1526383945;
```

1.6.1 last_insert_id

```
stmt_depends_on_first_successful_insert_id_in_prev_stmt
```

last_insert_id=

1.6.2 insert_id

log-short-format

```
auto_inc_intervals_in_cur_stmt_for_binlog.nb_elements()
```

last_id=

1.6.3 timestamp=**1.7**

```
# administrator command
```

is_command

1.8 SQL

```
insert into test4 values(1,'1');
```

2.20.4.2 dble

mysqldumpslowpt-query-digest dble

2.1

```
/FAKE_PATH/mysql, Version: FAKE_VERSION. started with:
```

```
Tcp port: 3320 Unix socket: FAKE_SOCK
```

Time	Id	Command	Argument
------	----	---------	----------

2.2 time

java80mysql

```
# Time: 2018-08-23T17:40:10.149000Z
```

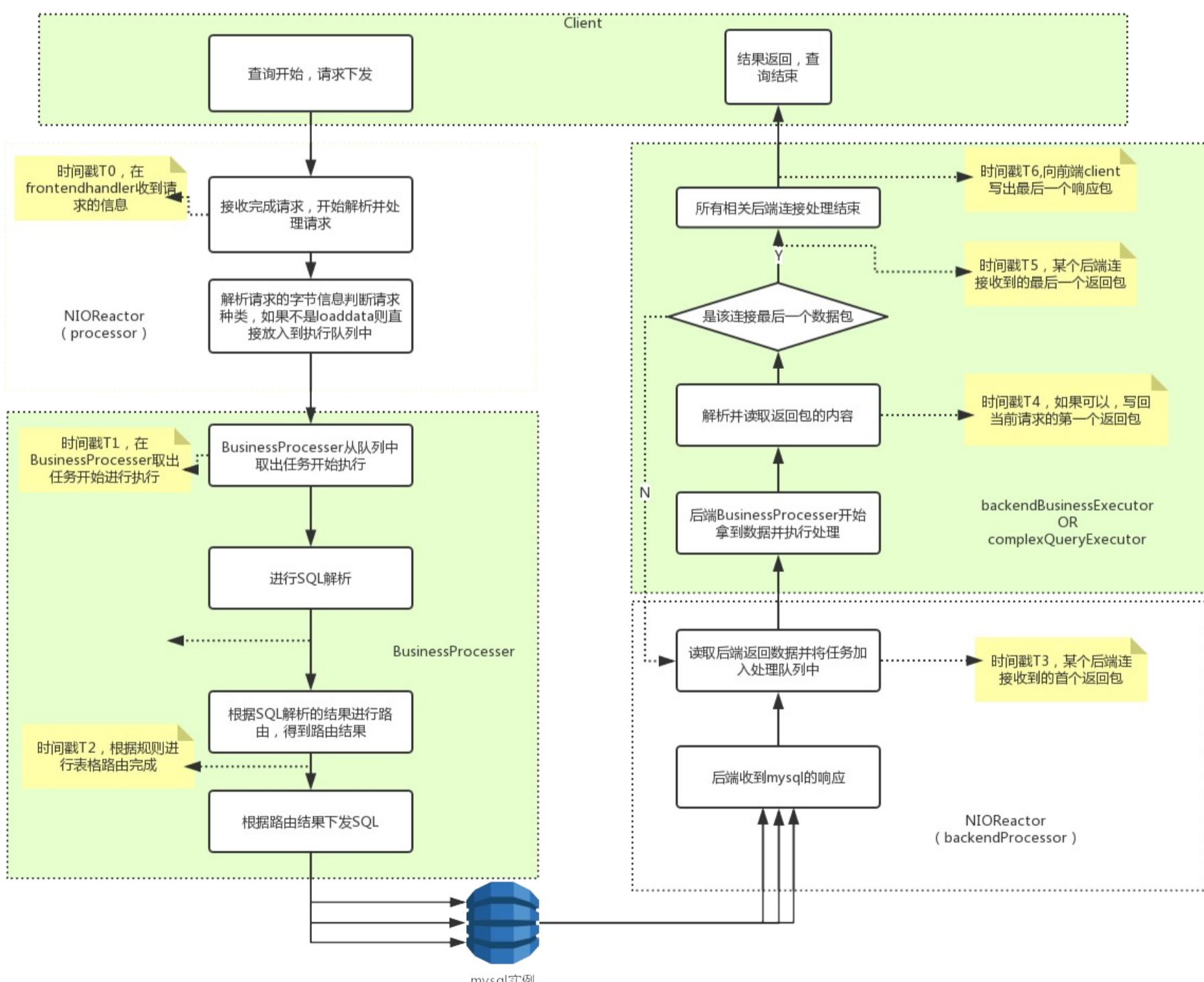
2.3 session

```
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id: 2
```

2.4

keyvalue.

dble



MySQL

Read_SQL: SQLSQL T1-T0

Prepare_Push//Read_SQL,T2-T1

{\$shardingnodeName}_First_Result_Fetch shardingnodeNamePrepare_Push ,T3-T2

shardingnodeName

```
{$shardingnodeName}_Last_Result_Fetch shardingnodeName{$shardingnodeName}__First_Result_Fetch,T5-T3
```

```
Inner_Execute show /set ... commitsql
```

```
Write_Client,T6-T4
```

```
MySQLQuery_timedbleSQL,T6-T0
```

```
Lock_timeRows_sentRows_examined0
```

```
# Query_time: 0.116672 Lock_time: 0.000000 Rows_sent: 0 Rows_examined: 0 Read_SQL: 0.013625 Prepare_Push: 0.024767 dn2_First_Result_Fetch: 0.056395 dn1_First_Result_Fetch: 0.026420 dn2_Last_Result_Fetch: 0.000743 dn1_Last_Result_Fetch: 0.001700 Write_Client: 0.051861
```

2.5 set(SET timestamp=)

```
SET timestamp=1535017210432;
```

2.6 SQL

```
insert into sharding_two_node values(15,'15',15),(519,'519',519);
```

2.21 SQLtrace

MySQL profiledbleSQLdbe session

1. trace

```
mysql> select @@trace;
+-----+
| @@trace |
+-----+
| 0      |
+-----+
1 row in set (0.02 sec)
```

2. trace

```
mysql> set trace =1;
Query OK, 0 rows affected (0.09 sec)

mysql> select @@trace;
+-----+
| @@trace |
+-----+
| 1      |
+-----+
1 row in set (0.00 sec)
```

3. trace

```
mysql> select * from sharding_two_node where id =1;
+----+-----+-----+
| id | c_flag | c_decimal |
+----+-----+-----+
| 1  | 1     | 1.0000 |
+----+-----+-----+
1 row in set (0.02 sec)

mysql> show trace;
+-----+-----+-----+-----+-----+-----+
| OPERATION      | START(ms) | END(ms)   | DURATION(ms) | SHARDING_NODE | SQL/REF           |
+-----+-----+-----+-----+-----+-----+
| Read SQL       | 0.0        | 0.1085    | 0.1085      | -            | -                |
| Parse SQL      | 0.1085    | 0.49607   | 0.38757     | -            | -                |
| Route Calculation | 0.49607 | 1.274142  | 0.778072    | -            | -                |
| Prepare to Push | 1.274142 | 1.560543  | 0.286401    | -            | -                |
| Execute SQL    | 1.560543 | 18.711851 | 17.151308   | dn1          | select * from sharding_two_node where id =1 |
| Fetch result   | 18.711851 | 18.978213 | 0.266362    | dn1          | select * from sharding_two_node where id =1 |
| Write to Client | 18.711851 | 19.276344 | 0.564493    | -            | -                |
| Over All       | 0.0        | 19.276344 | 19.276344   | -            | -                |
+-----+-----+-----+-----+-----+-----+
8 rows in set (0.00 sec)
```

4. trace

```
mysql> select * from sharding_two_node ;
+----+-----+-----+
| id | c_flag | c_decimal |
+----+-----+-----+
| 513 | 513   | 513.0000 |
| 514 | 514   | 514.0000 |
| 515 | 515   | 515.0000 |
| 516 | 516   | 516.0000 |
| 1  | 1     | 1.0000  |
| 2  | 2     | 2.0000  |
| 3  | 3     | 3.0000  |
| 4  | 4     | 4.0000  |
| 5  | 5     | 5.0000  |
| 7  | 7     | 7.0000  |
| 8  | 8     | 8.0000  |
| 9  | 9     | 9.0000  |
| 10 | 10    | 10.0000 |
| 11 | 11    | 11.0000 |
| 12 | 12    | 12.0000 |
+----+-----+-----+
```

```
15 rows in set (0.01 sec)
```

```
mysql> show trace;
```

OPERATION	START(ms)	END(ms)	DURATION(ms)	SHARDING_NODE	SQL/REF
Read SQL	0.0	0.079175	0.079175	-	-
Parse SQL	0.079175	0.637315	0.55814	-	-
Route Calculation	0.637315	1.046389	0.409074	-	-
Prepare to Push	1.046389	1.465238	0.418849	-	-
Execute SQL	1.465238	8.141409	6.676171	dn1	SELECT * FROM sharding_two_node LIMIT 100
Execute SQL	1.465238	7.59109	6.125852	dn2	SELECT * FROM sharding_two_node LIMIT 100
Fetch result	8.141409	8.817824	0.676415	dn1	SELECT * FROM sharding_two_node LIMIT 100
Fetch result	7.59109	8.366718	0.775628	dn2	SELECT * FROM sharding_two_node LIMIT 100
Write to Client	7.59109	9.324157	1.733067	-	-
Over All	0.0	9.324157	9.324157	-	-

```
10 rows in set (0.00 sec)
```

5. SQL trace,,

```
mysql> insert into sharding_two_node values(15,'15',15),(519,'519',519);
Query OK, 2 rows affected (0.06 sec)
```

```
mysql> show trace;
```

OPERATION	START(ms)	END(ms)	DURATION(ms)	SHARDING_NODE	SQL/REF
Read SQL	0.0	0.131959	0.131959	-	-
Parse SQL	0.131959	0.601637	0.469678	-	-
Route Calculation	0.601637	0.825479	0.223842	-	-
Prepare to Push	0.825479	1.025374	0.199895	-	-
Execute SQL	1.025374	27.095675	26.070301	dn1	INSERT INTO sharding_two_node VALUES (15, '15', 15)
Execute SQL	1.025374	25.023911	23.998537	dn2	INSERT INTO sharding_two_node VALUES (519, '519', 519)
Fetch result	27.095675	27.405046	0.309371	dn1	INSERT INTO sharding_two_node VALUES (15, '15', 15)
Fetch result	25.023911	26.478398	1.454487	dn2	INSERT INTO sharding_two_node VALUES (519, '519', 519)
Distributed Transaction Prepare	27.405046	27.736411	0.331365	-	-
Distributed Transaction Commit	27.736411	57.426311	29.6899	-	-
Write to Client	25.023911	57.428266	32.404355	-	-
Over All	0.0	57.428266	57.428266	-	-

```
12 rows in set (0.00 sec)
```

6. trace

```
mysql> select count(*) from sharding_two_node;
+-----+
| COUNT(*) |
+-----+
| 20 |
+-----+
1 row in set (0.01 sec)
```

```
mysql> show trace;
```

OPERATION	START(ms)	END(ms)	DURATION(ms)	SHARDING_NODE	SQL/REF
Read SQL	0.0	0.08553	0.08553	-	-

Parse SQL	0.08553	0.56987	0.48434	-	-
Try Route Calculation	0.56987	0.71698	0.14711	-	-
Try to Optimize	0.71698	1.237487	0.520507	-	-
Execute SQL	1.237487	9.091029	7.853542	dn1.0	select COUNT(*) as `\$_COUNT\$_rpda_0` from `sharding_tw_o_node` LIMIT 100
Fetch result	9.091029	10.186782	1.095753	dn1.0	select COUNT(*) as `\$_COUNT\$_rpda_0` from `sharding_tw_o_node` LIMIT 100
Execute SQL	1.237487	8.348635	7.111148	dn2.0	select COUNT(*) as `\$_COUNT\$_rpda_0` from `sharding_tw_o_node` LIMIT 100
Fetch result	8.348635	9.342241	0.993606	dn2.0	select COUNT(*) as `\$_COUNT\$_rpda_0` from `sharding_tw_o_node` LIMIT 100
MERGE	8.721543	10.289905	1.568362	merge.1	dn1.0; dn2.0
ORDERED_GROUP	8.726919	10.424309	1.69739	ordered_group.1	merge.1
LIMIT	9.020162	10.499574	1.479412	limit.1	ordered_group.1
SHUFFLE_FIELD	9.023584	10.501529	1.477945	shuffle_field.1	limit.1
Write to Client	9.072457	11.52055	2.448093	-	-
Over All	0.0	11.52055	11.52055	-	-

+-----+-----+-----+-----+-----+
-----+
14 rows in set (0.03 sec)

7. trace

mysql> select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);	+-----+	+-----+	+-----+	+-----+	+-----+
+-----+	COUNT(*)	+-----+	+-----+	+-----+	+-----+
+-----+	1	+-----+	+-----+	+-----+	+-----+
+-----+	1 row in set (0.03 sec)	+-----+	+-----+	+-----+	+-----+
mysql> show trace;	+-----+-----+-----+-----+-----+	+-----+-----+-----+-----+-----+	+-----+-----+-----+-----+-----+	+-----+-----+-----+-----+-----+	+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+	OPERATION	START(ms)	END(ms)	DURATION(ms)	SHARDING_NODE
+-----+-----+-----+-----+-----+	SQL/REF				
+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+	Read SQL	0.0	0.063047	0.063047	-
+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+	Parse SQL	0.063047	0.491182	0.428135	-
+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+	Try Route Calculation	0.491182	0.799576	0.308394	-
+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+	Try to Optimize	0.799576	2.347412	1.547836	-
+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+	Execute SQL	2.347412	11.183808	8.836396	dn1.0
+-----+-----+-----+-----+-----+	select `sharding_two_node`.`id` as `autoalias_scalar`				
+-----+-----+-----+-----+-----+	`from` `sharding_two_node` where id = 1 LIMIT 2				
+-----+-----+-----+-----+-----+	Fetch result	11.183808	12.360691	1.176883	dn1.0
+-----+-----+-----+-----+-----+	select `sharding_two_node`.`id` as `autoalias_scalar`				
+-----+-----+-----+-----+-----+	`from` `sharding_two_node` where id = 1 LIMIT 2				
+-----+-----+-----+-----+-----+	MERGE	11.889546	12.436445	0.546899	merge.1
+-----+-----+-----+-----+-----+	dn1.0				
+-----+-----+-----+-----+-----+	LIMIT	11.894923	12.483364	0.588441	limit.1
+-----+-----+-----+-----+-----+	merge.1				
+-----+-----+-----+-----+-----+	SHUFFLE_FIELD	11.896389	12.48483	0.588441	shuffle_field.1
+-----+-----+-----+-----+-----+	limit.1				
+-----+-----+-----+-----+-----+	SCALAR_SUB_QUERY	12.038123	12.485808	0.447685	scalar_sub_query.1
+-----+-----+-----+-----+-----+	shuffle_field.1				
+-----+-----+-----+-----+-----+	SCALAR_SUB_QUERY	12.485808	13.824463	1.338655	scalar_sub_query.1
+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+	Generate New Query	13.824463	26.749647	12.925184	dn1.1
+-----+-----+-----+-----+-----+	scalar_sub_query.1; select COUNT(*) as `\$_COUNT\$_rpda_0`				
+-----+-----+-----+-----+-----+	`from` `sharding_two_node` where sharding_two_node.id = 1				
+-----+-----+-----+-----+-----+	Fetch result	26.685134	28.753476	2.068342	dn1.1
+-----+-----+-----+-----+-----+	scalar_sub_query.1; select COUNT(*) as `\$_COUNT\$_rpda_0`				
+-----+-----+-----+-----+-----+	`from` `sharding_two_node` where sharding_two_node.id = 1				
+-----+-----+-----+-----+-----+	MERGE	26.954918	29.091683	2.136765	merge.2
+-----+-----+-----+-----+-----+	dn1.1				
+-----+-----+-----+-----+-----+	ORDERED_GROUP	26.977889	29.563316	2.585427	ordered_group.1
+-----+-----+-----+-----+-----+	merge.2				

SHUFFLE_FIELD	27.568285	29.567226	1.998941	shuffle_field.2	ordered_group.1
Write to Client	27.72517	30.014911	2.289741	-	-
Over All	0.0	30.014911	30.014911	-	-
+-----+-----+-----+-----+-----+					
------+-----+-----+-----+-----+					

18 rows in set (0.01 sec)

2.22 KILL @@DDL_LOCK

dble " There is other session is doing DDL " "xxx is doing DDL " reload

dble ZK DDL universe/dble/{cluster-id}/ddl/{schema.table} json status

1. status INIT table table metakeytable table meta
2. DDL DDL DDL status SUCCESS FAILED status SUCCESS DDLDDLtable table meta
3. universe/dble/{cluster-id}/ddl/{schema.table}/{dble-id}:SUCCESS

ddl

- universe/dble/{cluster-id}/ddl/{schema.table}/{dble-id}
- universe/dble/{cluster-id}/online/

DDLuniverse/dble/{cluster-id}/ddl/{schema.table}/ online universe/dble/{cluster-id}/ddl/{schema.table}/ DDL ddl

table meta universe/dble/{cluster-id}/ddl/{schema.table} kv

kill ddl_lock

ddlldl universe/dble/{cluster-id}/ddl/{schema.table} kv

1. kill
- 2.

2.23

- [2.23.1 MYSQL-HA](#)
- [2.23.2](#)
- [2.23.3](#)
- [2.23.4 HA](#)

2.23.1 MYSQL-HA

dble2.19.09.0

- HAdble
- HAMYSQL

- (dbGroup @@disable)
- (dbGroup @@enable)
- (dbGroup @@switch)

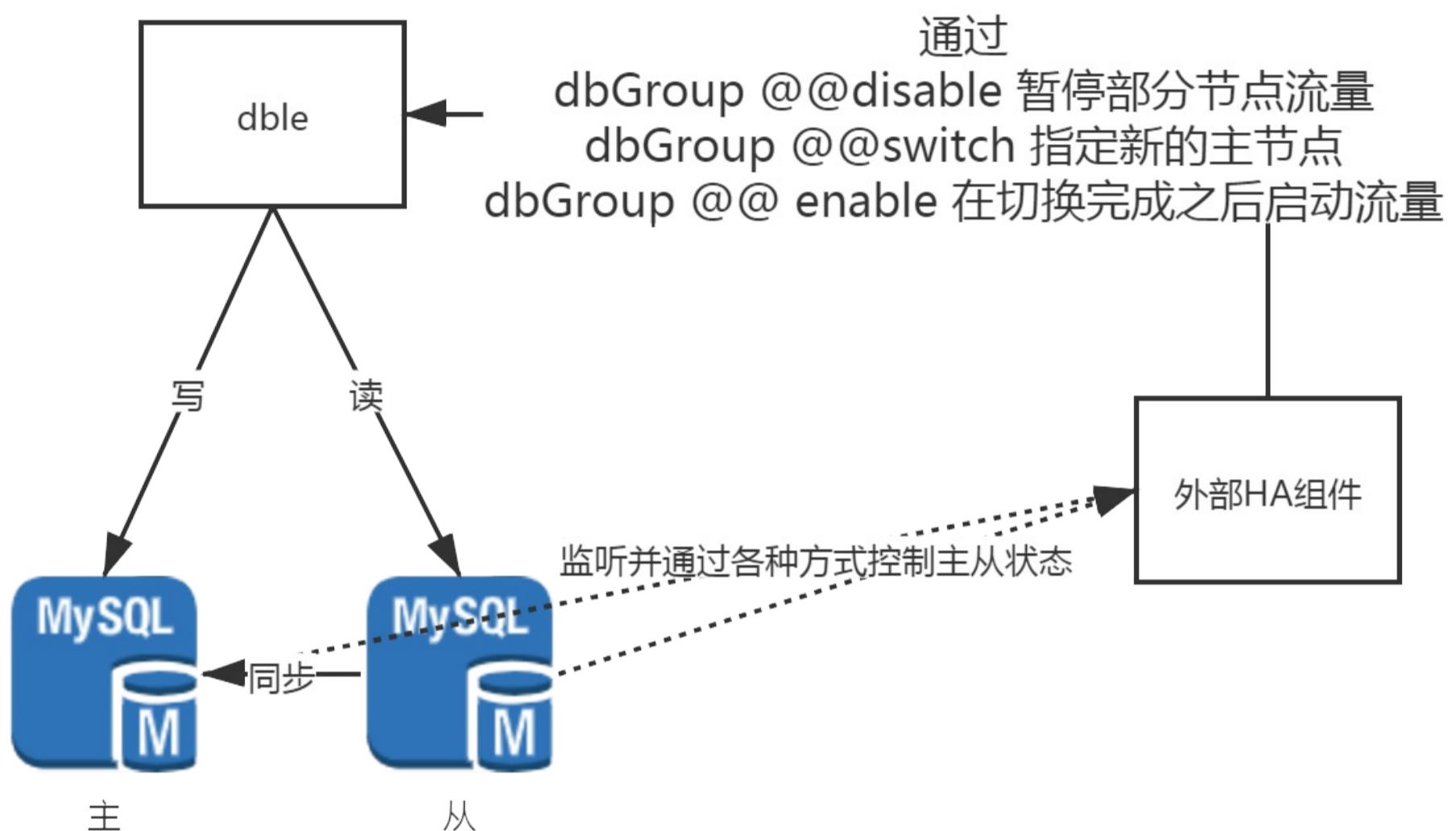
:

- (dbGroup @@events)

HA mysqlmysqlDBmysql

zkzkdbleHA

HAdble



HA

2.23.2 dbGroup

ha

dbleha

bootstrap.cnf

```
-DuseOuterHa=true
```

dble

cluster.cnf

needSyncHa = true

- dbledbGroup
- bootstrap.cnf useOuterHatrue
- bootstrap.cnf useOuterHacluster.cnfneedSyncHatrue

dble

dbleMySQL

dbInstance“disabled/enable”dbleMySQLMySQL

dbGroup @@disable

dbGroup @@disable name = 'dbGroup_name' [instance = 'instance_name']

- dbGroup_namedb.xmldbGroupinstance_namedbInstancename
- instance = '..'dbGroupdbInstancedisabled
- disabledmysql
- dbInstancedisableshow @@dbInstance
- dbledisable
- 5s
- disable

dbGroup @@enable

dbGroup @@enable name = 'dbGroup_name' [instance = 'instance_name']

- dbGroup_namedb.xmldbGroupinstance_namedbInstancename
- instance = '..'dbGroupdbInstanceenable

dbGroup @@switch

dbGroup @@switch name = 'dbGroup_name' master = 'instance_name'

- dbGroup_namedb.xmldbGroupinstance_namedbInstancename
- namemaster
- dbGroupprimarydbInstance
- dbInstancedisabledbInstanceprimaryprimarydbInstancedbInstance

2.23.3

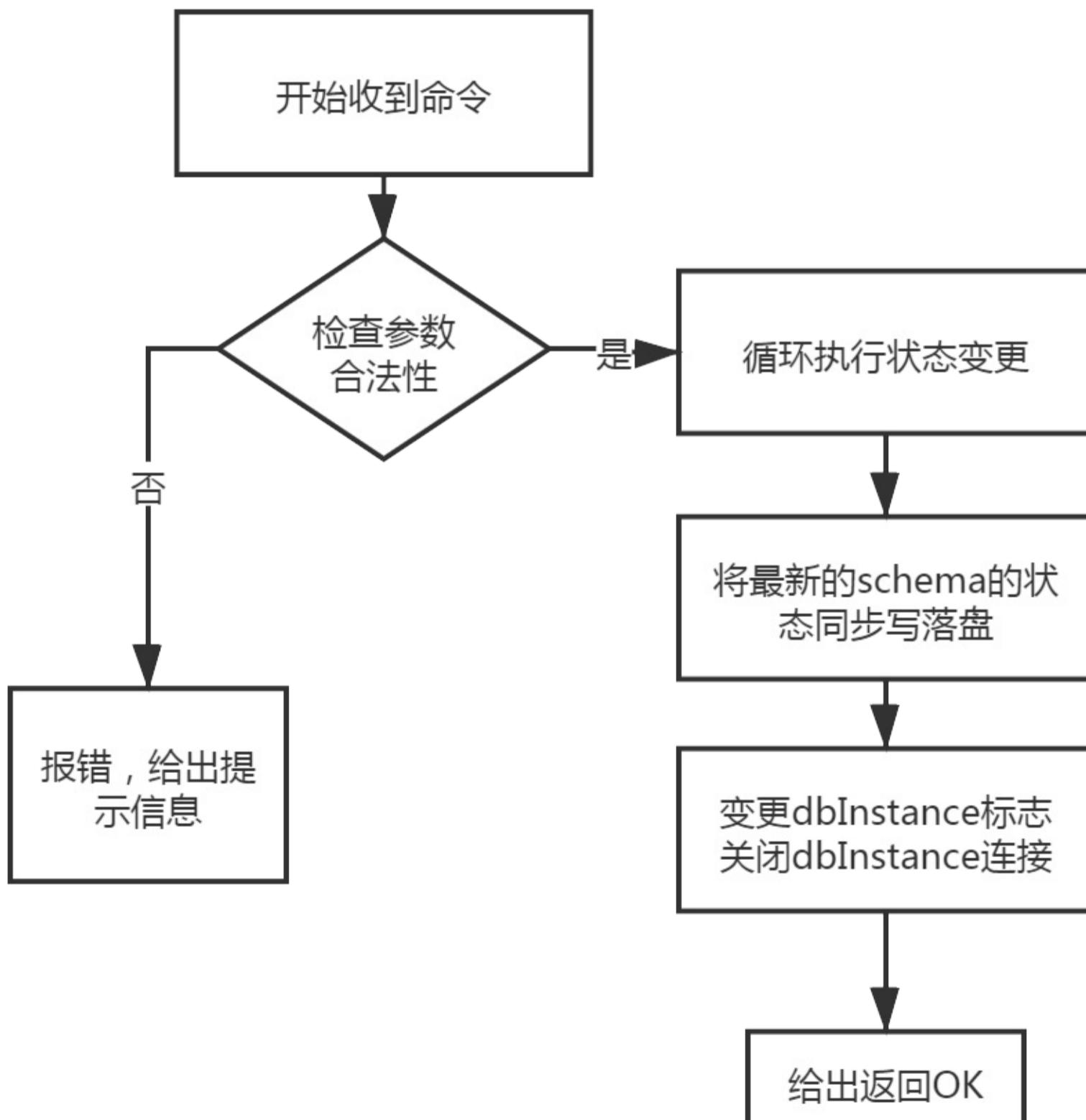
dbledbGroup

- disablezk
- enable
- switchprimary dbInstance

dbGroup @@disable

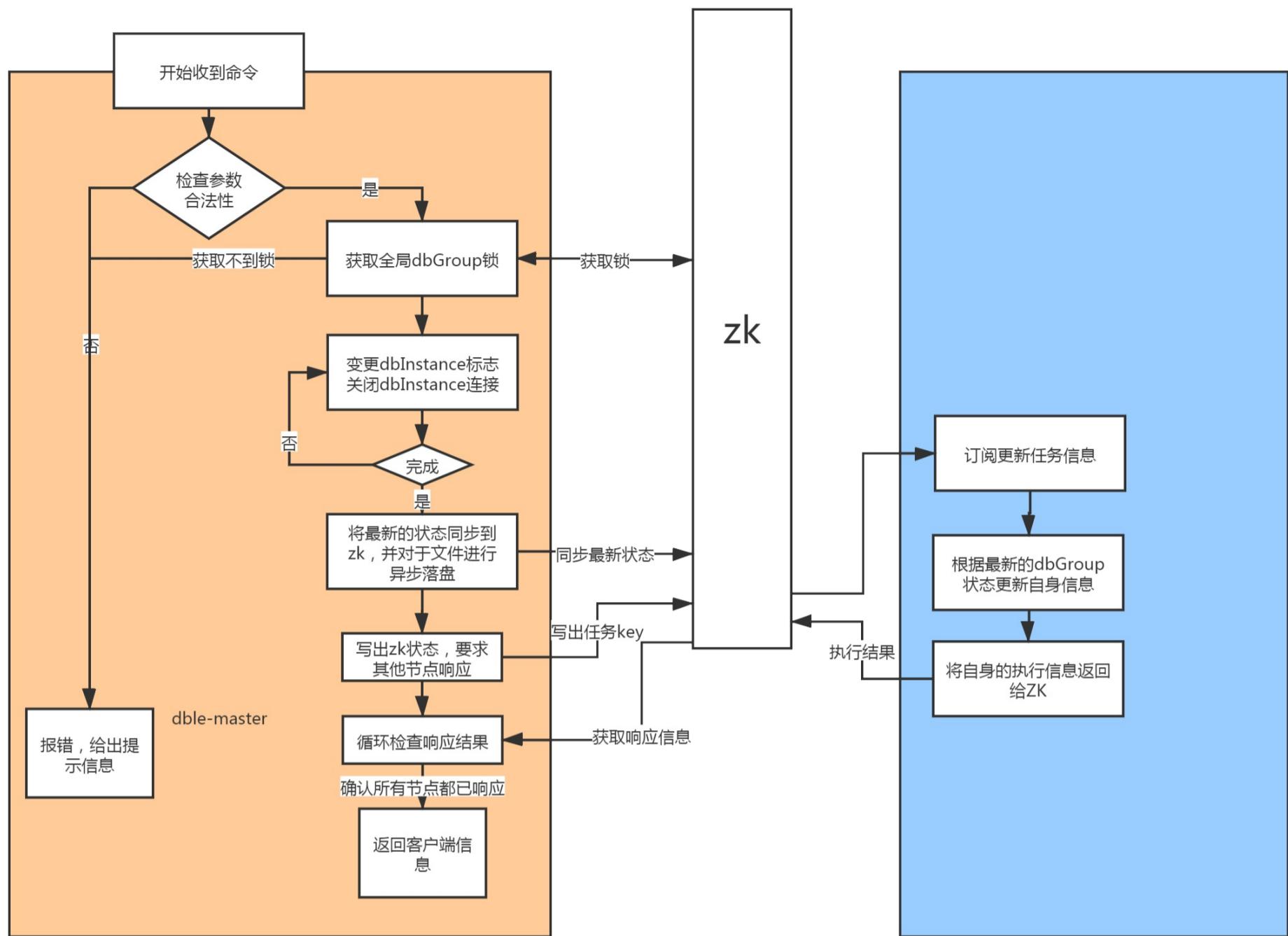
dble

-
- dbInstance
-
- dbGroup
- OK



-
- dbInstance
-
- dbGroup

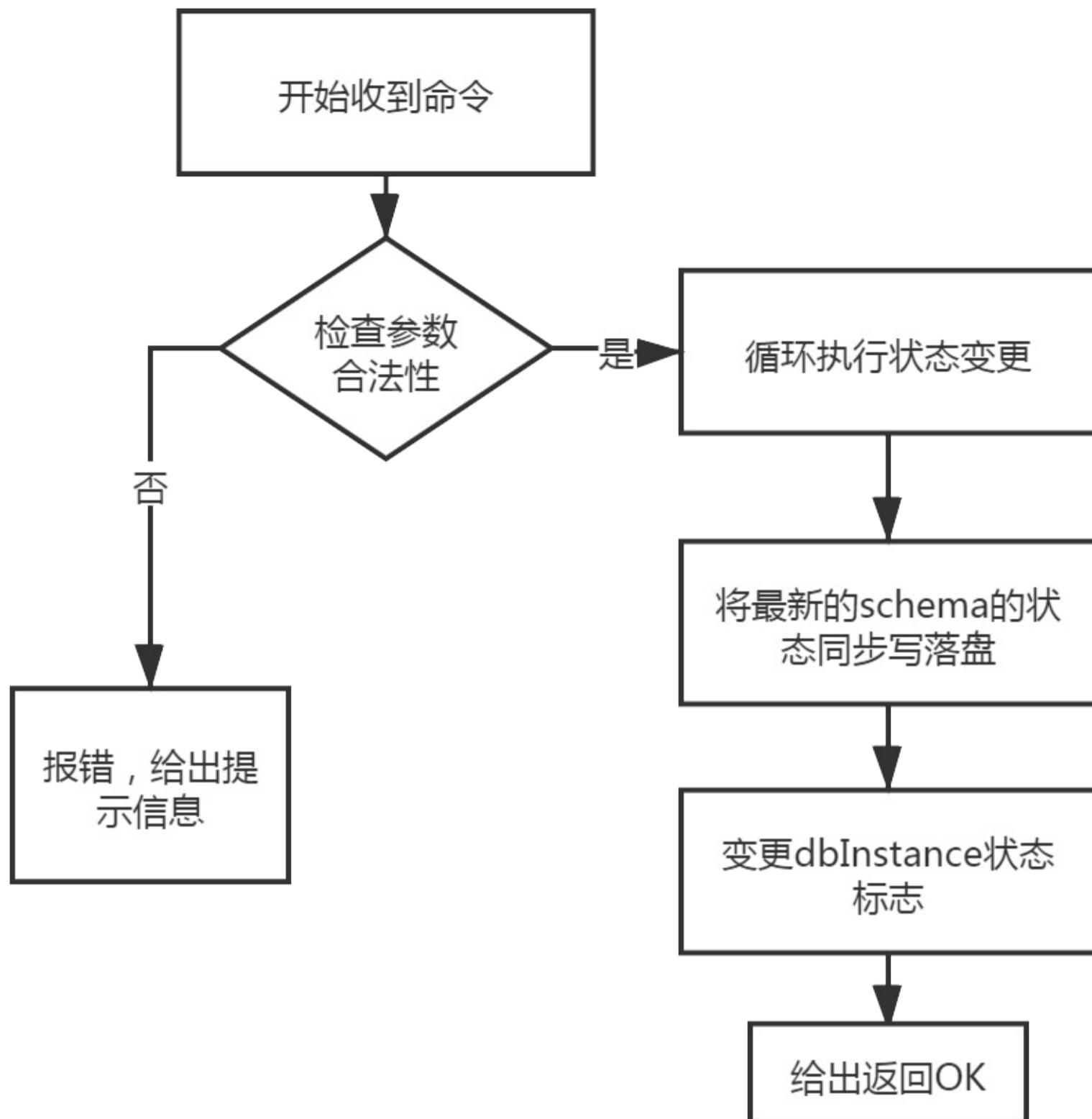
- dbGroupzk
- zkkey
-
- dble
-



dbGroup @@enable

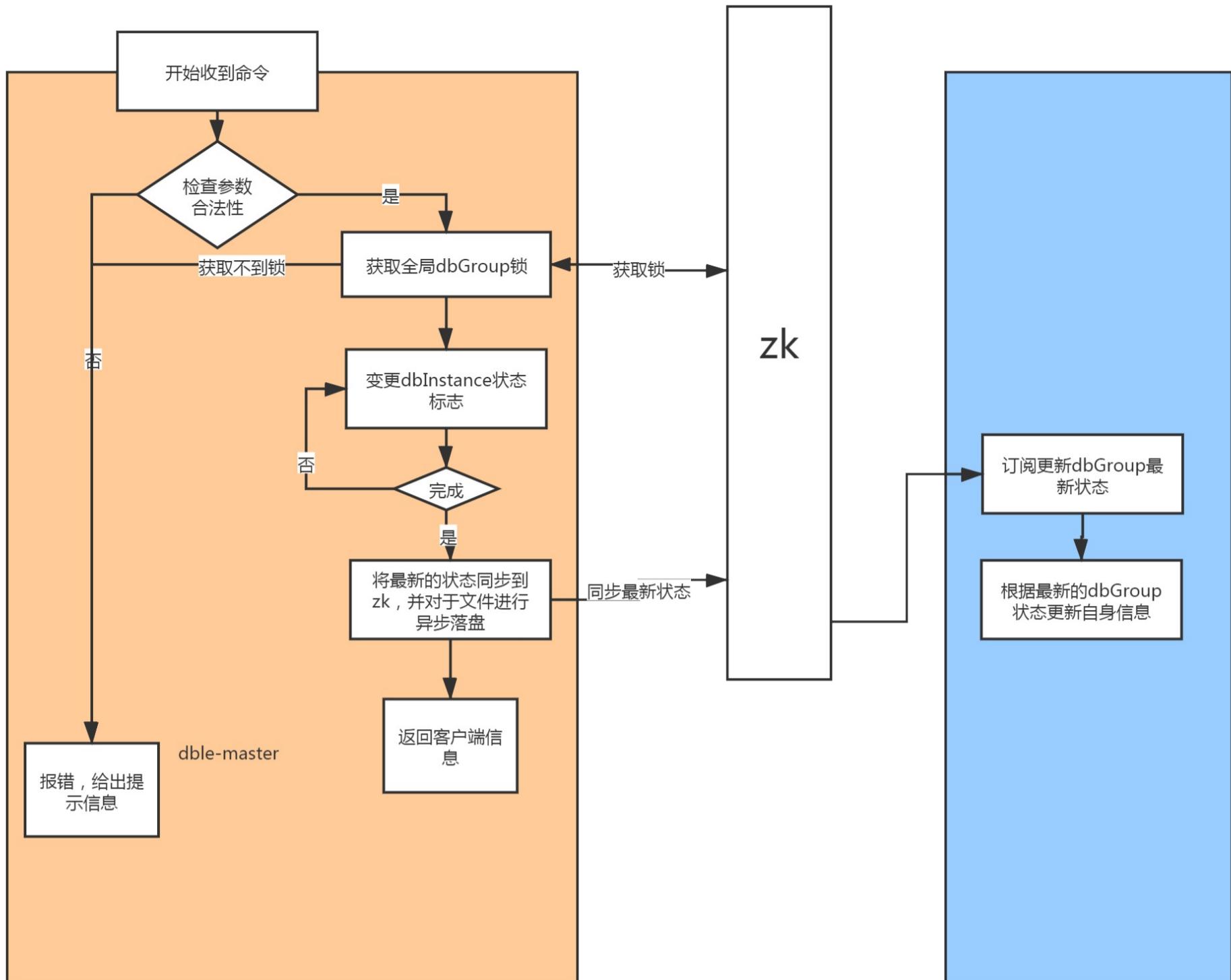
dble

- dbInstance
- dbGroup
- OK



ZK

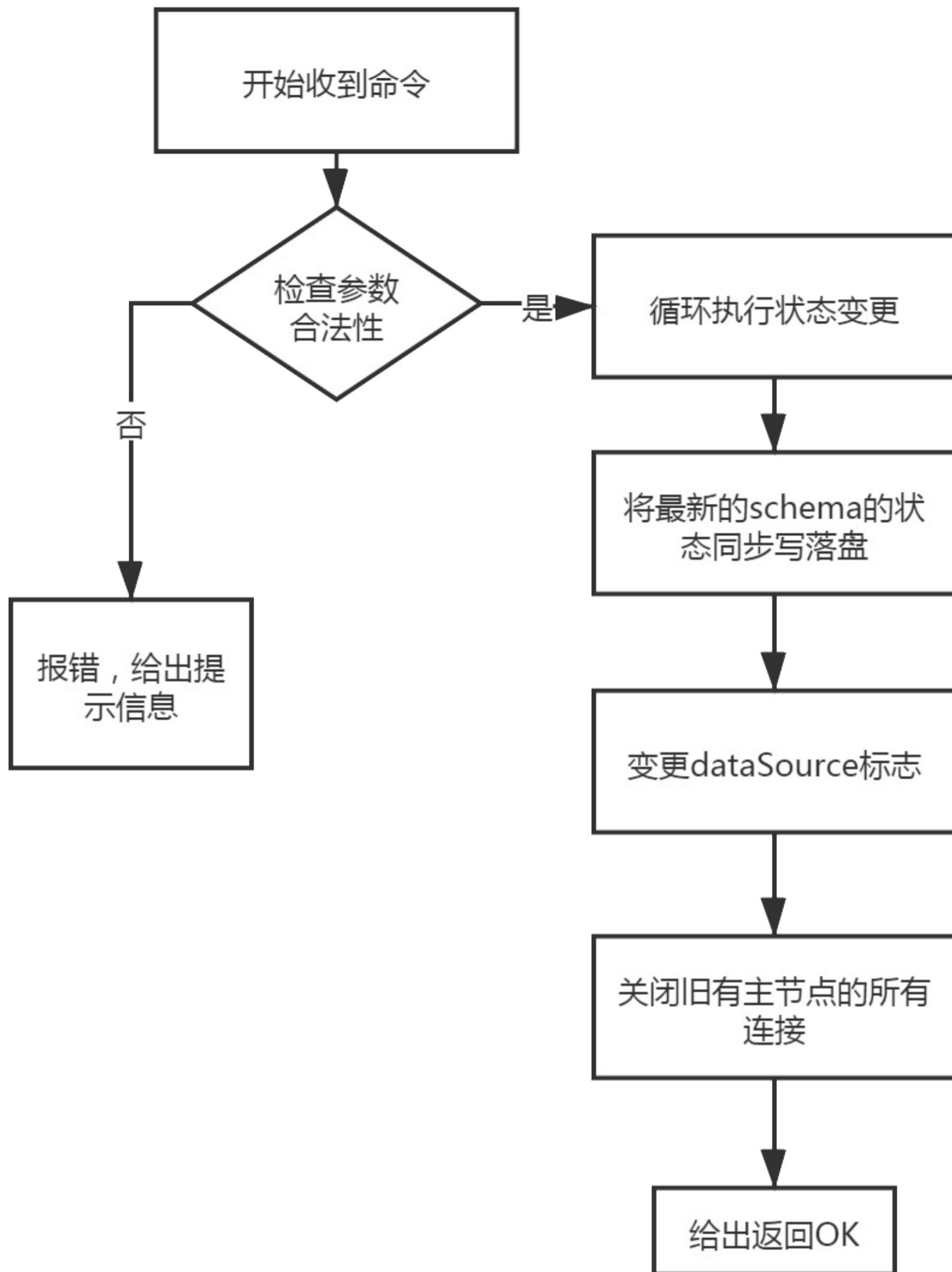
-
- ddbInstance
-
- dbGroup
- dbGroupzk
- zkkey
-
- dble
-



dbGroup @@switch

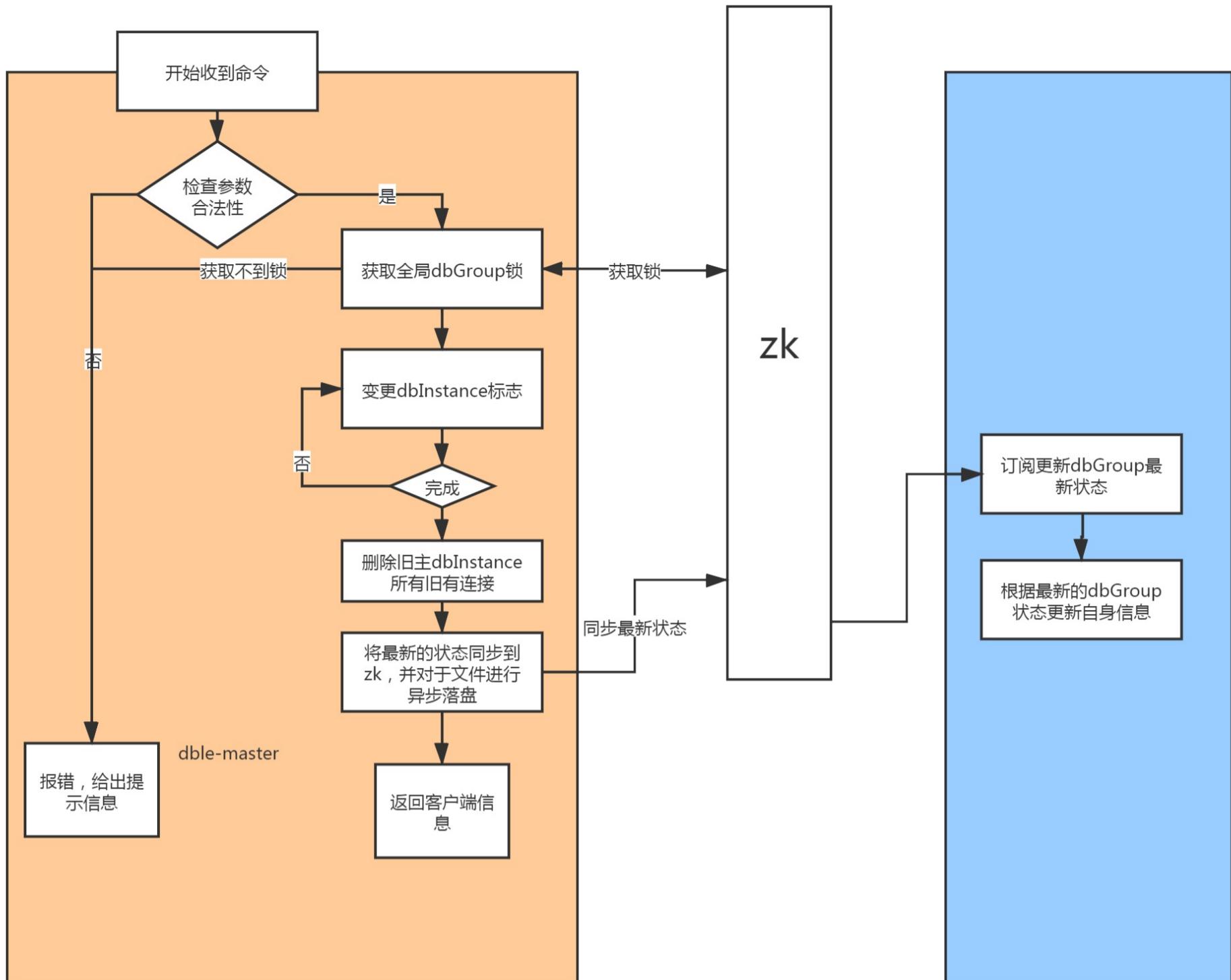
dble

-
- dbInstance
- primary dbInstance
- dbGroup
- OK



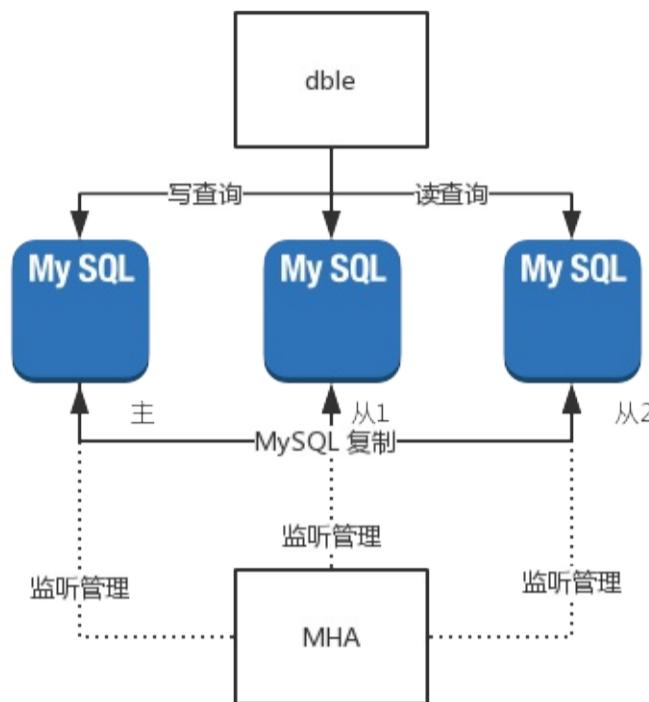
ZK

-
- dbInstance
-
- dbGroup
- dbGroupzk
- zkkey
-
- dble
-

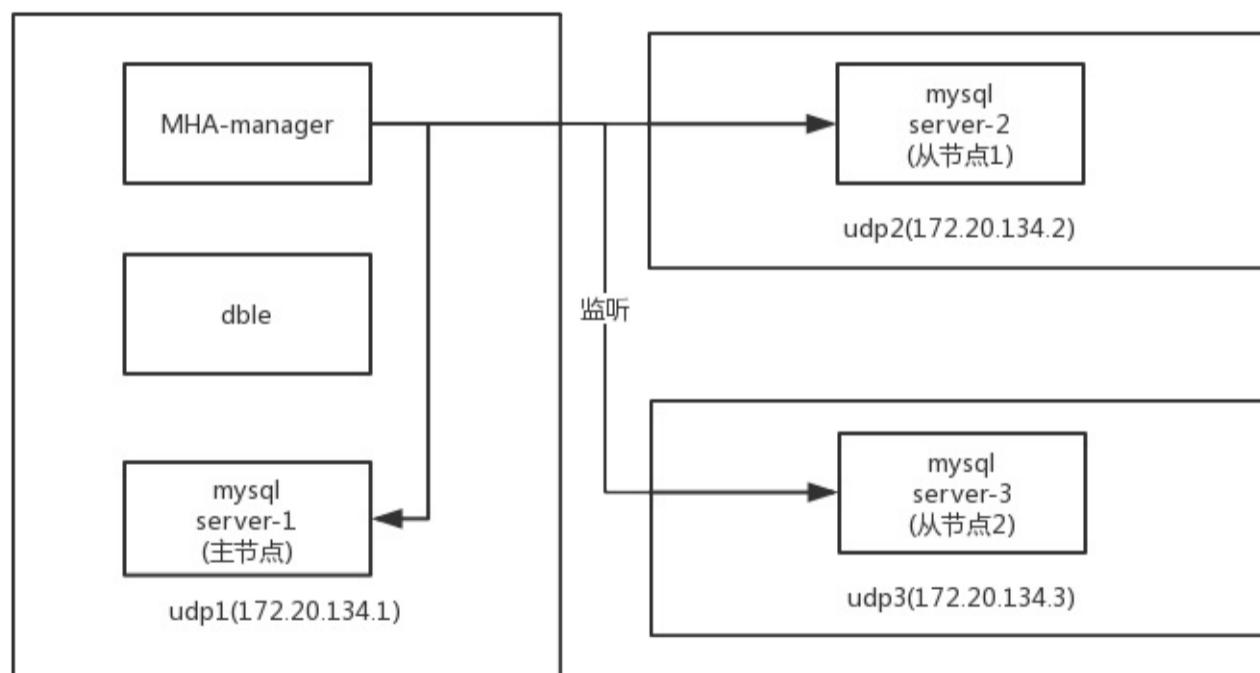


2.23.4 mha-dble

dbleMySQLdbGroupMHAMySQL



docker



- MySQL()
- MHAMySQL
- dbleMySQL
- kill MySQLMHA
- dbleMySQL

- dble2.19.09.0
- MHAdble

dockermysqlmysql()

mha

- dockerssh

```
/usr/sbin/sshd -D
```

- ,

```
ssh-keygen -t rsa
ssh-copy-id -i ~/.ssh/id_rsa.pub root@other1
ssh-copy-id -i ~/.ssh/id_rsa.pub root@other2
ssh-copy-id -i ~/.ssh/id_rsa.pub root@self
```

- /usr/bin/mysqlbinlog/usr/bin/mysqlyummymysql

- MHA

```
mkdir /etc/masterha/app1 -p
mkdir /var/log/masterha/app2 -p
mkdir /var/log/masterha/app1 -p
```

- mysql

```
grant all on *.* to root@'%' identified by '123456' with grant option;
grant replication slave on *.* to repl@'%' identified by 'repl';
```

- MHArpm

```
https://github.com/yoshinorim/mha4mysql-manager/wiki/Downloads
MHA Manager 0.56 rpm RHEL6
MHA Node 0.56 rpm RHEL6
rpm
yum localinstall rpmyum
NodeManager
rpm
yumrpmyumyum
```

mhaperlhamhamaster_ip_failover_script

https://github.com/yoshinorim/mha4mysql-manager/wiki/Parameters#master_ip_failover_script

- HAmaster_ip_failoverstatus
- MySQL mastermaster_ip_failoverstopmaster
- masterread_only=0master_ip_failoverstart

mhadble

- MySQL masterdbGroupdisablestopdbledbGroup @@disable
- MySQL masterstartdbGroup @@switchmasterdbGroup

master_ip_failover()

```
#!/usr/bin/env perl

# Copyright (C) 2011 DeNA Co.,Ltd.
#
# This program is free software; you can redistribute it and/or modify
# it under the terms of the GNU General Public License as published by
# the Free Software Foundation; either version 2 of the License, or
# (at your option) any later version.
#
# This program is distributed in the hope that it will be useful,
# but WITHOUT ANY WARRANTY; without even the implied warranty of
# MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
# GNU General Public License for more details.
#
```

```

# You should have received a copy of the GNU General Public License
# along with this program; if not, write to the Free Software
# Foundation, Inc.,
# 51 Franklin Street, Fifth Floor, Boston, MA  02110-1301  USA

## Note: This is a sample script and is not complete. Modify the script based on your environment.

use strict;
use warnings FATAL => 'all';

use Getopt::Long;
use MHA::DBHelper;

my (
    $command,          $ssh_user,          $orig_master_host,
    $orig_master_ip,  $orig_master_port, $new_master_host,
    $new_master_ip,   $new_master_port,  $new_master_user,
    $new_master_password
);
GetOptions(
    'command=s'        => \$command,
    'ssh_user=s'       => \$ssh_user,
    'orig_master_host=s' => \$orig_master_host,
    'orig_master_ip=s'  => \$orig_master_ip,
    'orig_master_port=i' => \$orig_master_port,
    'new_master_host=s'  => \$new_master_host,
    'new_master_ip=s'   => \$new_master_ip,
    'new_master_port=i'  => \$new_master_port,
    'new_master_user=s'  => \$new_master_user,
    'new_master_password=s' => \$new_master_password,
);
exit &main();

sub main {
    if ( $command eq "stop" || $command eq "stopssh" ) {

        # $orig_master_host, $orig_master_ip, $orig_master_port are passed.
        # If you manage master ip address at global catalog database,
        # invalidate orig_master_ip here.
        my $exit_code = 1;
        eval {

            # dbGroup @@disable name = "dbGroup1" instance='$orig_master_host'
            # disable
            $orig_master_host =~ tr/./_/;
            system "mysql -P9066 -u man1 -p654321 -h 172.20.134.1 -e \"dbGroup \\@\\@disable name = 'dbGroup1' instance='".$orig_master_host."'\""
        };
        $exit_code = 0;
    };
    if ($@) {
        warn "Got Error: $@\n";
        exit $exit_code;
    }
    exit $exit_code;
}
elsif ( $command eq "start" ) {

    # all arguments are passed.
    # If you manage master ip address at global catalog database,
    # activate new_master_ip here.
    # You can also grant write access (create user, set read_only=0, etc) here.
    my $exit_code = 10;
    eval {
        my $new_master_handler = new MHA::DBHelper();

        # args: hostname, port, user, password, raise_error_or_not
        $new_master_handler->connect( $new_master_ip, $new_master_port,
                                      $new_master_user, $new_master_password, 1 );

        ## Set read_only=0 on the new master
        $new_master_handler->disable_log_bin_local();
        print "Set read_only=0 on the new master.\n";
        $new_master_handler->disable_read_only();

        ## Creating an app user on the new master
        print "Creating app user on the new master..\n";
        $new_master_handler->enable_log_bin_local();
}

```

```
$new_master_handler->disconnect();

## try to switch the dbGroup master into new master
## dbGroup switchnew_master_host
$new_master_host =~tr./_/';
system "mysql -P9066 -u man1 -p654321 -h 172.20.134.1 -e \"dbGroup \@\@switch name = 'dbGroup1' master='\".$new_master_host.\"'\"";

$exit_code = 0;
};

if ($@) {
warn $@;

# If you want to continue failover, exit 10.
exit $exit_code;
}

else {
&usage();
exit 1;
}

sub usage {
print
"Usage: master_ip_failover --command=start|stop|stopssh|status --orig_master_host=host --orig_master_ip=ip --orig_master_port=port --new_master_host=host --new_master_ip=ip --new_master_port=port\n";
}
}
```

/etc/masterha/app1

MHA app1.conf/etc/masterha/app1

```
#mha manager
manager_workdir = /var/log/masterha/app1
manager_log = /var/log/masterha/app1/app1.log
remote_workdir = /var/log/masterha/app2
master_ip_failover_script=/etc/masterha/app1/master_ip_failover
# master_ip_online_change_script=/etc/masterha/app1/master_ip_online_change
# MySQL
user=root
password=123456
# ssh
ssh_user=root

#
repl_user=repl
repl_password= repl

# ()
ping_interval=1
manager_log=/var/log/masterha/app1/manager.log

[server1]
hostname=172.20.134.1
master_binlog_dir = /opt/3306/
port=3306

[server2]
# mysql
hostname=172.20.134.2
master_binlog_dir = /opt/3306/
candidate_master=1
check_repl_delay=0
port=3306

[server3]
# mysql
hostname=172.20.134.3
master_binlog_dir = /opt/3306/
candidate_master=1
check_repl_delay=0
port=3306
```

MHA

```
nohup masterha_manager --conf=/etc/masterha/app1/app1.conf >> /var/log/masterha/app1/manager.log 2>&1 &
```

dble

dblerelease2.19.09.0conf

```
mv cluster_template.cnf cluster.cnf
mv bootstrap_template.cnf bootstrap.cnf
mv db_template.xml db.xml
mv user_template.xml user.xml
mv sharding_template.xml sharding.xml
```

db.xml

db.xml

```
<dbGroup name="dbGroup1" delayThreshold="10000">
    <heartbeat>show slave status</heartbeat>
    <dbInstance name="172_20_134_1" url="172.20.134.1:3306" password="123456" user="root" disabled="false" id="udp-1" primary="true" />
    <dbInstance name="172_20_134_2" url="172.20.134.2:3306" password="123456" user="root" disabled="false" id="udp-3" />
    <dbInstance name="172_20_134_3" url="172.20.134.3:3306" password="123456" user="root" disabled="false" id="udp-2" />
</dbGroup>
```

dbleman1dble

```
MySQL [(none)]> show @@dbinstance;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| DB_GROUP | NAME      | HOST      | PORT | W/R   | ACTIVE | IDLE | SIZE | EXECUTE | READ_LOAD | WRITE_LOAD | DISABLED |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| dbGroup1 | 172_20_134_1 | 172.20.134.1 | 3306 | W     | 1     | 0    | 1000 | 1       | 0          | 0          | false    |
| dbGroup1 | 172_20_134_3 | 172.20.134.3 | 3306 | R     | 1     | 0    | 1000 | 0       | 0          | 0          | false    |
| dbGroup1 | 172_20_134_2 | 172.20.134.2 | 3306 | R     | 1     | 0    | 1000 | 0       | 0          | 0          | false    |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```

172.20.134.1”

- ps172.20.134.1mysqld
- kill -9 172.20.134.1mysqld
- dble

```
MySQL [(none)]> show @@dbinstance;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| DB_GROUP | NAME      | HOST      | PORT | W/R   | ACTIVE | IDLE | SIZE | EXECUTE | READ_LOAD | WRITE_LOAD | DISABLED |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| dbGroup1 | 172_20_134_2 | 172.20.134.2 | 3306 | W     | 1     | 0    | 1000 | 0       | 0          | 0          | false    |
| dbGroup1 | 172_20_134_3 | 172.20.134.3 | 3306 | R     | 1     | 0    | 1000 | 0       | 0          | 0          | false    |
| dbGroup1 | 172_20_134_1 | 172.20.134.1 | 3306 | R     | 0     | 0    | 1000 | 0       | 0          | 0          | true     |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```

- dble,172_20_134_2

```
<dbGroup name="dbGroup1" delayThreshold="10000">
    <heartbeat>show slave status</heartbeat>
    <dbInstance name="172_20_134_1" url="172.20.134.1:3306" password="123456" user="root" disabled="false" id="udp-1" />
    <dbInstance name="172_20_134_2" url="172.20.134.2:3306" password="123456" user="root" disabled="false" id="udp-3" />
    <dbInstance name="172_20_134_3" url="172.20.134.3:3306" password="123456" user="root" disabled="false" id="udp-2" primary="true" />
</dbGroup>
```

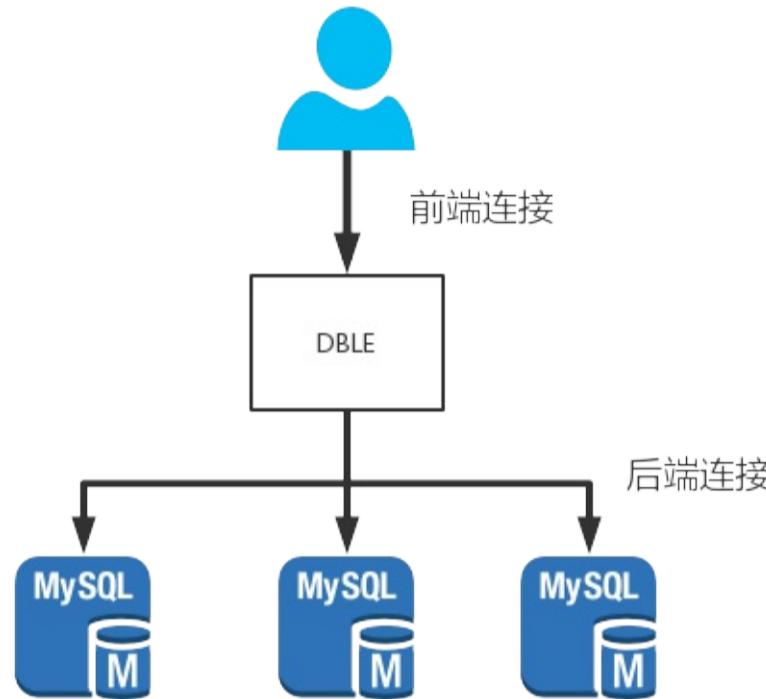
- 172.20.134.3mysql172.20.134.2dbe

```
MySQL [(none)]> show slave status\G
***** 1. row *****
Slave_IO_State: Waiting for master to send event
Master_Host: 172.20.134.2
Master_User: repl
Master_Port: 3306
```

```
    Connect_Retry: 60
    Master_Log_File: mysql-bin.000001
    Read_Master_Log_Pos: 2113
        Relay_Log_File: udp3-relay-bin.000002
        Relay_Log_Pos: 320
    Relay_Master_Log_File: mysql-bin.000001
    Slave_IO_Running: Yes
    Slave_SQL_Running: Yes
....
```

2.24 /

dbledbldblemysql



TCPdbledble dble

bootstrap.cnf

- sqlExecuteTimeout()
- idleTimeout
- processorCheckPeriod

- dbleprocessorCheckPeriod
- - - sqlExecuteTimeout
 - DDLxa
 - - xacommit/rollback
 - idleTimeout

- DDL,XAsqlExecuteTimeout
- XAidleTimeoutloaddata

SQL

-
- SQL
- load dataidleTimeoutidleTimeout
- processorCheckPeriodSQL

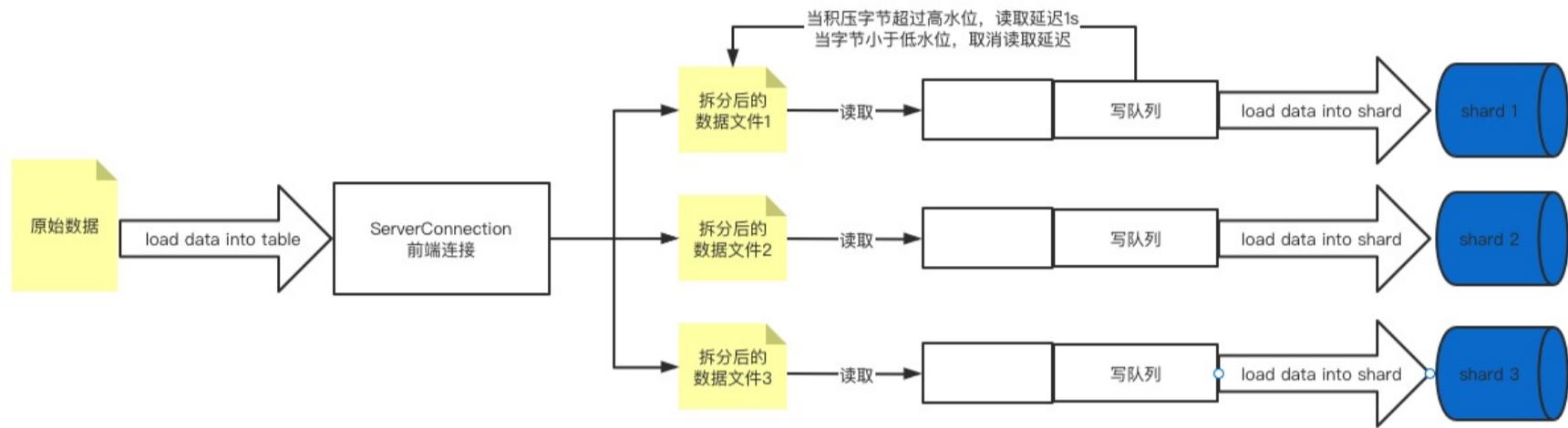
2.25 dble

dbleloaddbdbleOOM
2.20.04@ssxlulu/load

dble

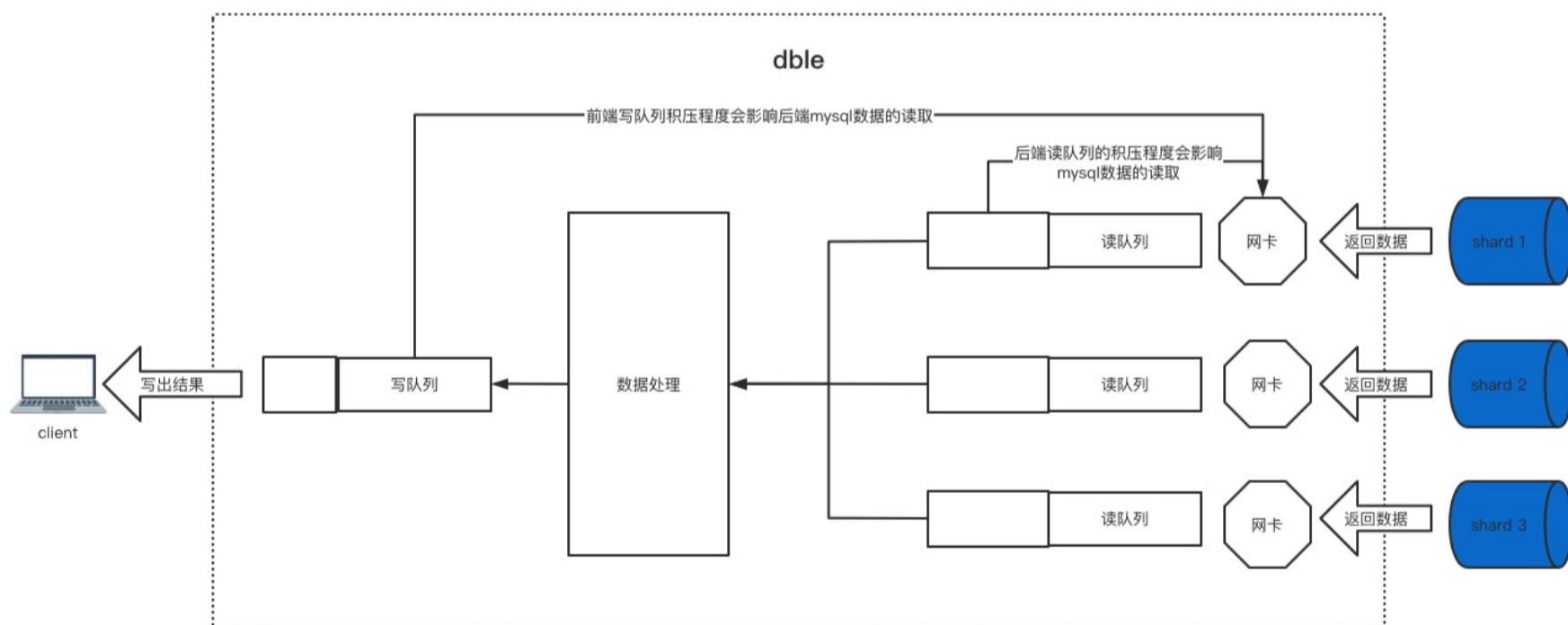
- Load data

- (flowHighLevel)(flowLowLevel)



- Select

- ()(flowControlHighLevel),MySQL
- MySQL(mysql),(flowHighLevel)mysql
- (flowControlLowLevel)(flowLowLevel),mysql
-



,nio

bootstrap.cnf

```
enableFlowControl()
flowControlHighLevel()
flowControlLowLevel()
```

bootstrap.cnf

- ```
flow_control @@set [enableFlowControl = true/false] [flowControlHighLevel = ?] [flowControlLowLevel = ?]
```
- flowLowLevel flowHighLevel bootstrap.cnf enableFlowControl
-

- 
- flow\_control @@show .
  - :
  - flow\_control @@list
  - dble\_information.dble\_flow\_control flow\_control @@list

## 2.26 /client\_found\_rows

### 2.26.1 &

DBLEdbclient\_found\_rows

#### 2.26.1.1 client\_found\_rows

handshakeclient\_found\_rowsDML(found rows)(affect rows)

#### 2.26.1.2 client\_found\_rows

MySQLclient\_found\_rowaffect rows

JDBCclient\_found\_rowsfound rows

#### 2.26.1.3 JDBCuseAffectedRowsclient\_found\_row

useAffectedRows=true client\_found\_rows

useAffectedRows=false() client\_found\_rows

## 2.26.2

### 2.26.2.1 bootstrap.cnf

```
#client_found_rows
-DcapClientFoundRows=false
```

### 2.26.2.2

```
show @@cap_client_found_rows; -- client_found_row 0- 1-
disable @@cap_client_found_rows; -- client_found_row
enable @@cap_client_found_rows; -- client_found_row
```

dblemysql() insert

## 2.26.3

step1. dble(client\_found\_rows)

step2. client\_found\_rows

```
mysql -uman1 -h192.xx.xx.xx -P9066 -p654321
enable @@cap_client_found_rows;
```

step3.

- 3.20.10.0dbleclient\_found\_rows

```
mysql -uroot -h192.xx.xx.xx -P8066 -p123456
ERROR 1045 (HY000): The client requested CLIENT_FOUND_ROWS capabilities does not match, in the manager use show @@cap_client_found_rows check latest status.
```

- 3.20.10.1dble.logdbleclient\_found\_rowsdbleclient\_found\_rows

```
the client requested CLIENT_FOUND_ROWS capabilities is 'found rows', dble is configured as 'affect rows', pls set the same.
or
the client requested CLIENT_FOUND_ROWS capabilities is 'affect rows', dble is configured as 'found rows', pls set the same.
```

## 2.27 general

### 2.27.1

generaldblesql()file 3%5%sql

1.Executedblelong data16general

2.Executesqlsql

### 2.27.2 bootstrap.cnfgeneral log

```
dble/tmp/
-DhomePath=.

general long0-1-
#-DenableGeneralLog=1

general loggeneral/general.log'/'homepath
general/general.log/tmp/general/general.log
/general/general.log/general/general.log
#-DgeneralLogFile=general/general.log

16mb16MBgeneral.logyyy-MM/general-MM-dd-%d.log
#-DgeneralLogFileSize=16

24096
#-DgeneralLogQueueSize=4096
```

### 2.27.3

#### 2.27.3.1 show @@general\_log

generaluse dble\_information; select \* from dble\_variables where variable\_name like '%general%';

```
show @@general_log;
+-----+-----+
| NAME | VALUE |
+-----+-----+
| general_log | ON |
| general_log_file | /tmp./general/general.log |
+-----+-----+
2 rows in set (0.03 sec)
```

#### 2.27.3.2 disable @@general\_log

general log

```
disable @@general_log;
Query OK, 1 row affected (0.02 sec)
disable general_log success
```

#### 2.27.3.3 enable @@general\_log

general log

```
enable @@general_log;
Query OK, 1 row affected (0.02 sec)
enable general_log success
```

#### 2.27.3.4 reload @@general\_log\_file=?

general log

```
reload @@general_log_file='/tmp/dble-general/general/general.log';
Query OK, 1 row affected (0.00 sec)
reload general log path success
```

## 2.28 sql

### 2.28.1

- dblesql(CRUD)()
- sqldblesql
- - -DsamplingRate=100 ()0%~15%(1000wselect)
  - ( -DenableStatisticAnalysis=1 -DenableStatisticAnalysis=1 -DsamplingRate=100 )0%~30%(1000wselect)
  - 
  - -DenableStatisticAnalysis=1 sqlshow @@sql.sum.tabletablesqltable
- prometheusdble

### 2.28.2 bootstrap.cnfsql

```
statistic0-1-
#-DenableStatistic=0

show @@sql.sum.usershow @@sql.sum.tableshow @@sql.condition0-1-
#-DenableStatisticAnalysis=0

1024
#-DassociateTablesByEntryByUserTableSize=1024
#-DfrontendByBackendByEntryByUserTableSize=1024
#-DtableByUserByEntryTableSize=1024

24096
#-DstatisticQueueSize=4096

100[0,100] %
#-DsamplingRate=100

sql_log
#-DsqlLogTableSize=1024
```

### 2.28.3

#### 2.28.3.1 show @@statistic

statistic

```
show @@statistic;
+-----+-----+
| NAME | VALUE |
+-----+-----+
statistic	OFF
statisticAnalysis	OFF
associateTablesByEntryByUserTableSize	1024
frontendByBackendByEntryByUserTableSize	1024
tableByUserByEntryTableSize	1024
samplingRate	0
sqlLogTableSize	1024
queueMonitor	monitoring
+-----+-----+
6 rows in set (0.01 sec)
```

#### 2.28.3.2 disable @@statistic

sql

```
disable @@statistic;
Query OK, 1 row affected (0.01 sec)
```

#### 2.28.3.3 enable @@statistic

sql

```
enable @@statistic;
Query OK, 1 row affected (4.26 sec)
```

#### 2.28.3.4 reload @@statistic\_table\_size = ? [where table='?' | where table in (dbe\_information.tableA,...)]

```

reload @@statistic_table_size = 90;
Query OK, 1 row affected (0.02 sec)

reload @@statistic_table_size = 90 where table = 'sql_statistic_by_table_by_user_by_entry';
Query OK, 1 row affected (0.02 sec)

reload @@statistic_table_size = 90 where table in(sql_statistic_by_table_by_user_by_entry,sql_statistic_by_associate_tables_by_entry_by_user);
Query OK, 1 row affected (0.02 sec)

reload @@statistic_table_size = 90 where table = 'sql_log';
Query OK, 1 row affected (0.02 sec)

```

**2.28.3.5 reload @@samplingRate=?**

(0)

```

reload @@samplingRate=90;
Query OK, 1 row affected (0.01 sec)

```

**2.28.3.2 disable @@statisticAnalysis**

show @@sql.sum.usershow @@sql.sum.tableshow @@sql.condition

```

disable @@statisticAnalysis;
Query OK, 1 row affected (0.01 sec)

```

**2.28.3.3 enable @@statisticAnalysis**

show @@sql.sum.usershow @@sql.sum.tableshow @@sql.condition

```

enable @@statisticAnalysis;
Query OK, 1 row affected (4.26 sec)

```

**2.28.4**

```

:
sql_log sql_log_by_digest_by_entry_by_user (sql_log)
sql_log_by_tx_by_entry_by_user (sql_log)
sql_log_by_tx_digest_by_entry_by_user (sql_log)

:
sql_statistic_by_frontend_by_backend_by_entry_by_user
sql_statistic_by_table_by_user_by_entry
sql_statistic_by_associate_tables_by_entry_by_user

()truncate

```

**2.28.5**

()

sharding:

- dblesql
- explainexplain2
- exit

rwsplit:

- sql1064
- multi-query(sql,mysql clientdelimiter)multi-querysql(commit)

enableStatistic=0statisticAnalysis=0samplingRate=0sql(sql\_logsql\_statistic\_by\_frontend\_by\_xxxx)

**2.28.6****2.28.6.1 start @@statistic\_queue\_monitor [observeTime = ? [and intervalTime = ?]]**

observeTimeintervalTime(:s,m/min,h)

```

start @@statistic_queue_monitor; -- observeTime1minintervalTime5s
start @@statistic_queue_monitor observeTime = 2min; -- observeTime2minintervalTime5s
start @@statistic_queue_monitor observeTime = 2min and intervalTime = 10s; -- observeTime2minintervalTime10s

```

**2.28.6.2 stop @@statistic\_queue\_monitor"**

```
stop @@statistic_queue_monitor";
```

#### 2.28.6.3 show @@statistic\_queue.usage

()

```
show @@statistic_queue.usage;
+-----+-----+
| TIME | USAGE |
+-----+-----+
2021-05-31 16:33:30	0.00%
2021-05-31 16:33:35	0.00%
2021-05-31 16:33:40	0.00%
+-----+-----+
3 rows in set (0.01 sec)
```

TIME  
USAGE

#### 2.28.6.4 drop @@statistic\_queue.usage

```
drop @@statistic_queue.usage;
```

#### 2.28.6.5

```
1(show @@statisticqueueMonitoring)(statisticOFFsamplingRate0).
2start @@statistic_queue_monitor. 3start @@statistic_queue_monitor.
4(SoftReference)jvm().
5(statisticQueueSize)select * from dble_variables where variable_name='statisticQueueSize'.
6(statisticQueueSize)bootstrap.cnfdbc.
```

## 2.29 load data

### 2.29.1

```
load dataload data"“bootstrap.cnfload dataload dataDBLEload dataload dataDBLEload datasqlload data
:
1. kill @@load_data,/temp/error
2.
3.
4.--.txt1-data-table-dn1.txt1datatabledn1
```

### 2.29.2 bootstrap.cnfload data

```
BatchLoadData0-1-
#-DenableBatchLoadData=1
100000
#-DmaxRowSizeToFile=100000
```

### 2.29.3

#### 2.29.3.1 show @@load\_data.fail

load data

```
show @@load_data.fail;
Empty set (0.01 sec)

if have error file may like
show @@load_data.fail;
+-----+
| error_load_data_file |
+-----+
| ./temp/error/1-data-table-dn1.txt |
| ./temp/error/1-data-table-dn2.txt |
+-----+
2 rows in set (0.01 sec)
```

#### 2.29.3.2 disable @@load\_data\_batch

load data

```
disable @@load_data_batch;
Query OK, 1 row affected (0.00 sec)
disable load_data_batch success
```

#### 2.29.3.3 enable @@load\_data\_batch

load data

```
enable @@load_data_batch;
Query OK, 1 row affected (0.01 sec)
enable load_data_batch success
```

#### 2.29.3.4 reload @@load\_data.num=

load data

```
reload @@load_data.num=200000;
Query OK, 1 row affected (0.00 sec)
reload @@load_data.num success
```

### 2.29.5 kill @@load\_data

```
kill @@load_data;
Query OK, 1 row affected (0.00 sec)
kill @@load_data success
```



## 2.30 injoin

### Issue

#### example

| SHARDING_NODE              | TYPE                     | SQL/REF                                                                                      |
|----------------------------|--------------------------|----------------------------------------------------------------------------------------------|
| dn1_0                      | BASE_SQL                 | select `a`.`id`, `a`.`name` from `gtest` `a` ORDER BY `a`.`id` ASC                           |
| dn2_0                      | BASE_SQL                 | select `a`.`id`, `a`.`name` from `gtest` `a` ORDER BY `a`.`id` ASC                           |
| merge_and_order_1          | MERGE_AND_ORDER          | dn1_0; dn2_0                                                                                 |
| shuffle_field_1            | SHUFFLE_FIELD            | merge_and_order_1                                                                            |
| dn1_1                      | BASE_SQL                 | select DISTINCT `b`.`id` as `autoalias_scalar` from `test` `b` ORDER BY autoalias_scalar ASC |
| dn2_1                      | BASE_SQL                 | select DISTINCT `b`.`id` as `autoalias_scalar` from `test` `b` ORDER BY autoalias_scalar ASC |
| merge_and_order_2          | MERGE_AND_ORDER          | dn1_1; dn2_1                                                                                 |
| distinct_1                 | DISTINCT                 | merge_and_order_2                                                                            |
| shuffle_field_3            | SHUFFLE_FIELD            | distinct_1                                                                                   |
| rename_derived_sub_query_1 | RENAME_DERIVED_SUB_QUERY | shuffle_field_3                                                                              |
| shuffle_field_4            | SHUFFLE_FIELD            | rename_derived_sub_query_1                                                                   |
| join_1                     | JOIN                     | shuffle_field_1; shuffle_field_4                                                             |
| shuffle_field_2            | SHUFFLE_FIELD            | join_1                                                                                       |

- inSubQueryTransformToJoin = false in

| SHARDING_NODE     | TYPE                  | SQL/REF                                                                                                                    |
|-------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------|
| dn1_0             | BASE_SQL              | select DISTINCT `b`.`id` as `autoalias_scalar` from `test` `b`                                                             |
| dn2_0             | BASE_SQL              | select DISTINCT `b`.`id` as `autoalias_scalar` from `test` `b`                                                             |
| merge_1           | MERGE                 | dn1_0; dn2_0                                                                                                               |
| distinct_1        | DISTINCT              | merge_1                                                                                                                    |
| shuffle_field_1   | SHUFFLE_FIELD         | distinct_1                                                                                                                 |
| in_sub_query_1    | IN_SUB_QUERY          | shuffle_field_1                                                                                                            |
| dn1_1             | BASE_SQL(May No Need) | in_sub_query_1; select `a`.`id`, `a`.`name` from `gtest` `a` where `a`.`id` in ('{NEED_TO_REPLACE}') ORDER BY `a`.`id` ASC |
| dn2_1             | BASE_SQL(May No Need) | in_sub_query_1; select `a`.`id`, `a`.`name` from `gtest` `a` where `a`.`id` in ('{NEED_TO_REPLACE}') ORDER BY `a`.`id` ASC |
| merge_and_order_1 | MERGE_AND_ORDER       | dn1_1; dn2_1                                                                                                               |
| shuffle_field_2   | SHUFFLE_FIELD         | merge_and_order_1                                                                                                          |

# Resolution

testgttest select b.id from test b subQuery. sql select a.\* from gtest a where 1=1 and a.id in (select b.id from test b) order by a.id; sql ininSubQueryTransformToJoin = truejoinmysql inSubQueryTransformToJoin = falsesubQuerysqlsubQuerymysqljoinsubQuery

## conditions

- Column
  - join
  - having
  - order by
  - where
  - 
  - inwheredbl

## **explain comparison**

- `scalar_sub_query`, `in_sub_query`, `all_any_sub_query` SQL/REF `in_sub_query`

## example

sql

```
SELECT a.id, select max(b.id) from test b where b.id in (select distinct d.id from sing1 d) as name FROM sharding_4_t1 a ORDER BY a.id;
```

**step**

- sqlColumn
  - inwhere

## special

any, some ,alldblein

- any some =in
  - all! = <> in

## example

in

- select \* from sharding\_4\_t1 where id=any(select id from test where age=1) order by name desc;
  - select \* from sharding\_4\_t1 where id!=all(select id from test where age=1) order by name desc;

in

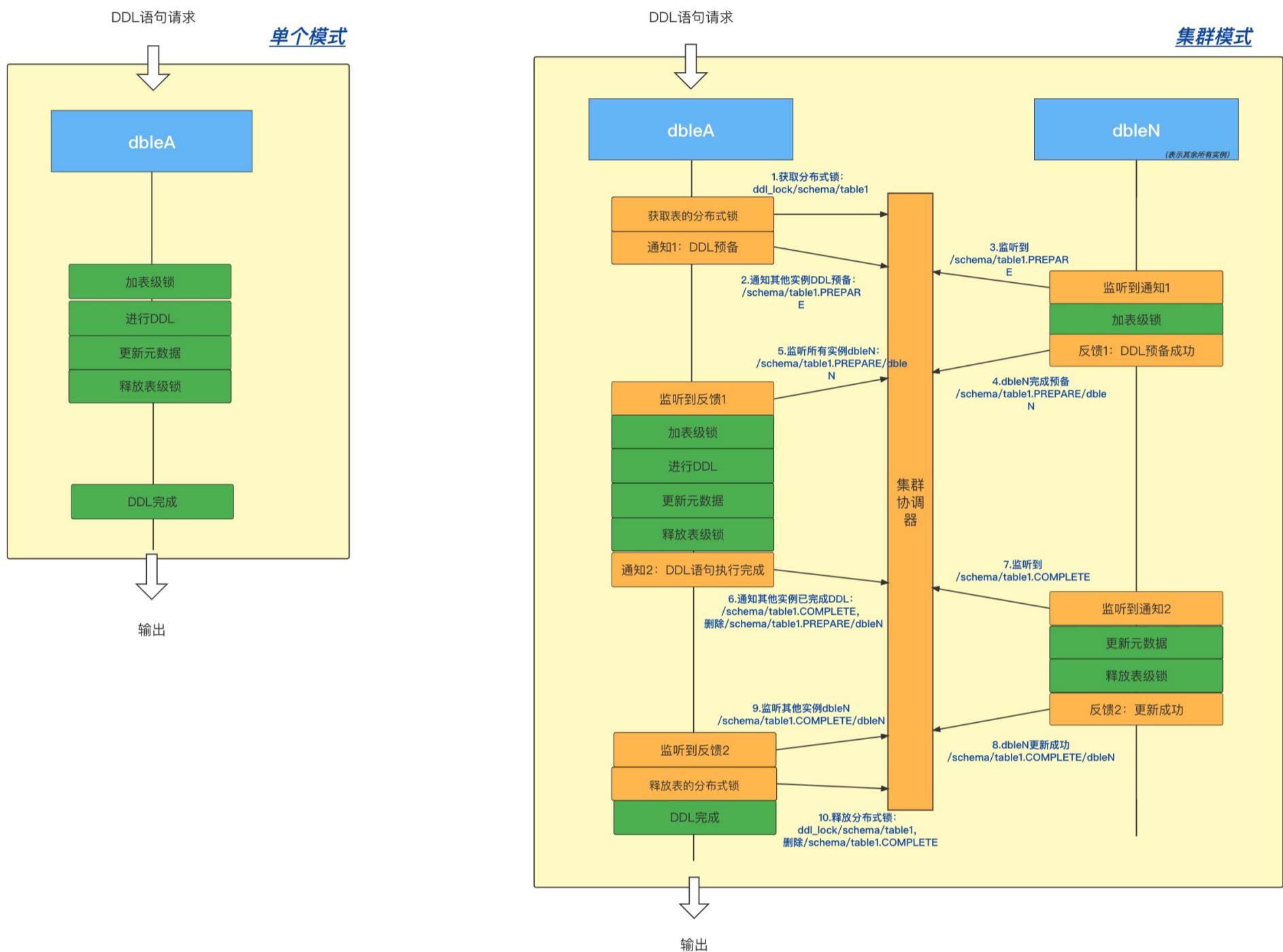
- select \* from sharding\_4\_t1 where id!=any(select id from test where age=1) order by name desc;
  - select \* from sharding\_4\_t1 where id!=all(select id from test where age=1) order by name desc;

in

## 2.31 DDL

&gt;=3.22.01

### DDL



[DDL\_{id}{.}] &lt;{{.}}&gt; {}

### SQL1

```
CREATE TABLE tableB (id int(11) DEFAULT NULL, id2 int(11) DEFAULT NULL, name varchar(100) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

|                            |     | dbleA                                                          | dbleN                                                    |
|----------------------------|-----|----------------------------------------------------------------|----------------------------------------------------------|
| init_ddl_trace             | DDL | [DDL_2] init_ddl_trace                                         |                                                          |
| notice_cluster_ddl_prepare |     | [DDL_2]<br>notice_cluster_ddl_prepare.start<br>/*ddl.PREPARE*/ | [DDL_NOTIFIED]<br>receive_ddl_prepare<br>/*ddl.PREPARE*/ |
| notice_cluster_ddl_prepare |     |                                                                | [DDL_NOTIFIED]                                           |

|                                           |  |                                                                  |                                                            |
|-------------------------------------------|--|------------------------------------------------------------------|------------------------------------------------------------|
| ddl<br>( )                                |  |                                                                  | add_table_lock.start<br>/**/                               |
|                                           |  |                                                                  | [DDL_NOTIFIED]<br>add_table_lock.succ<br>/**/              |
|                                           |  | [DDL_2]<br>notice_cluster_ddl_prepare.succ<br>/*ddl.PREPARE*/    |                                                            |
| add_table_lock                            |  | [DDL_2] add_table_lock.start<br>/**/                             |                                                            |
|                                           |  | [DDL_2] add_table_lock.succ<br>/**/                              |                                                            |
|                                           |  | [DDL_2] test_ddl_conn.start<br>/* */                             |                                                            |
|                                           |  | [DDL_2.dn1] test_ddl_conn.start<br>/*dn1 */                      |                                                            |
| test_ddl_conn<br>'select 1';<br>(tableB)  |  | [DDL_2.dn1] test_ddl_conn.get_conn<br>/*dn1dn2~4 */              |                                                            |
|                                           |  | [DDL_2.dn1] test_ddl_conn.succ<br>/*dn1select 1dn2~4 */          |                                                            |
|                                           |  | [DDL_2] test_ddl_conn.succ<br>/*select 1dn2~4 */                 |                                                            |
| exec_ddl_sql<br>ddl                       |  | [DDL_2] exec_ddl_sql.start<br>/*sql */                           |                                                            |
|                                           |  | [DDL_2.dn1] exec_ddl_sql.start<br>/*dn1ddldn2~4 */               |                                                            |
|                                           |  | [DDL_2.dn1] exec_ddl_sql.get_conn<br>/*dn1dn2~4*/                |                                                            |
|                                           |  | [DDL_2.dn1] exec_ddl_sql.succ<br>/*dn1ddldn2~4*/                 |                                                            |
|                                           |  | [DDL_2] exec_ddl_sql.succ<br>/*ddl */                            |                                                            |
| update_table_metadata                     |  | [DDL_2] update_table_metadata.start<br>/**/                      |                                                            |
|                                           |  | [DDL_2] update_table_metadata.succ<br>/**/                       |                                                            |
|                                           |  | [DDL_2]<br>notice_cluster_ddl_complete.start<br>/*ddl.COMPLETE*/ |                                                            |
|                                           |  |                                                                  | [DDL_NOTIFIED]<br>receive_ddl_complete<br>/*ddl.COMPLETE*/ |
| notice_cluster_ddl_complete<br>DDL<br>( ) |  |                                                                  | [DDL_NOTIFIED]<br>update_table_metadata.start<br>/**/      |
|                                           |  |                                                                  | [DDL_NOTIFIED]<br>update_table_metadata.succ<br>/**/       |
|                                           |  |                                                                  | [DDL_NOTIFIED]<br>release_table_lock.succ<br>/**/          |
|                                           |  | [DDL_2]<br>notice_cluster_ddl_complete.succ<br>/*ddl.COMPLETE*/  |                                                            |
| release_table_lock                        |  | [DDL_2] release_table_lock.succ<br>/**/                          |                                                            |
| finish_ddl_trace<br>DDL                   |  | [DDL_2] finish_ddl_trace                                         |                                                            |

|          |  |
|----------|--|
| succ     |  |
| fail     |  |
| get_conn |  |

dbeAbleN()dbeASQL1

**dbleA**

```

2021-12-23 10:42:05,425 [INFO][BusinessExecutor1] ===== init_ddl_trace [DDL_2] ===== (:)
2021-12-23 10:42:05,425 [INFO][BusinessExecutor1] [DDL_2] <init_ddl_trace> Routes end and Start ddl{CREATE TABLE `tableB` (`id` int(11) DEFAULT NULL, `id2` int(11) DEFAULT NULL, `name` varchar(100) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1} execution stage. In FrontendConnection[id = 1 port = 8066 host = 127.0.0.1 local_port = 52436 isManager = false startupTime = 1640227316027 skipCheck = false isFlowControl = false] (:)
2021-12-23 10:42:05,425 [INFO][BusinessExecutor1] [DDL_2] <notice_cluster_ddl_prepare.start> Notify and wait for all instances to enter phase PREPARE (:)
2021-12-23 10:42:05,547 [INFO][BusinessExecutor1] [DDL_2] <notice_cluster_ddl_prepare.succ> All instances have entered phase PREPARE (:)
2021-12-23 10:42:05,547 [INFO][BusinessExecutor1] [DDL_2] <add_table_lock.start> (:)
2021-12-23 10:42:05,547 [INFO][BusinessExecutor1] [DDL_2] <add_table_lock.succ> (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2] <test_ddl_conn.start> Start execute 'select 1' to detect a valid connection for shardingNodes[dn1,dn3,dn2,dn4] (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2.dn1] <test_ddl_conn.start> In shardingNode[dn1],about to execute sql{select 1} (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2.dn1] <test_ddl_conn.get_conn> Get BackendConnection[id = 9 host = 10.186.63.8 port = 24801 localPort = 52423 mysqlId = 5924 db config = dbInstance[name=instanceM1,disabled=false,maxCon=10,minCon=3] (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2.dn2] <test_ddl_conn.start> In shardingNode[dn2],about to execute sql{select 1} (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2.dn2] <test_ddl_conn.get_conn> Get BackendConnection[id = 11 host = 10.186.63.7 port = 24801 localPort = 52426 mysqlId = 3282 db config = dbInstance[name=instanceM2,disabled=false,maxCon=10,minCon=3] (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2.dn3] <test_ddl_conn.start> In shardingNode[dn3],about to execute sql{select 1} (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2.dn3] <test_ddl_conn.get_conn> Get BackendConnection[id = 8 host = 10.186.63.8 port = 24801 localPort = 52424 mysqlId = 5925 db config = dbInstance[name=instanceM1,disabled=false,maxCon=10,minCon=3] (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2.dn4] <test_ddl_conn.start> In shardingNode[dn4],about to execute sql{select 1} (:)
2021-12-23 10:42:05,548 [INFO][BusinessExecutor1] [DDL_2.dn4] <test_ddl_conn.get_conn> Get BackendConnection[id = 10 host = 10.186.63.7 port = 24801 localPort = 52427 mysqlId = 3281 db config = dbInstance[name=instanceM2,disabled=false,maxCon=10,minCon=3] (:)
2021-12-23 10:42:05,550 [INFO][complexQueryExecutor4] [DDL_2.dn1] <test_ddl_conn.succ> (:)
2021-12-23 10:42:05,550 [INFO][complexQueryExecutor4] [DDL_2.dn3] <test_ddl_conn.succ> (:)
2021-12-23 10:42:05,553 [INFO][complexQueryExecutor4] [DDL_2.dn4] <test_ddl_conn.succ> (:)
2021-12-23 10:42:05,553 [INFO][complexQueryExecutor2] [DDL_2.dn2] <test_ddl_conn.succ> (:)
2021-12-23 10:42:05,553 [INFO][complexQueryExecutor2] [DDL_2] <test_ddl_conn.succ> (:)
2021-12-23 10:42:05,553 [INFO][complexQueryExecutor2] [DDL_2] <exec_ddl_sql.start> This ddl will be executed separately in the shardingNodes[dn1,dn3,dn2,dn4] (:)
2021-12-23 10:42:05,553 [INFO][complexQueryExecutor2] [DDL_2.dn1] <exec_ddl_sql.start> In shardingNode[dn1],about to execute sql{CREATE TABLE `tableB` (`id` int(11) DEFAULT NULL, `id2` int(11) DEFAULT NULL, `name` varchar(100) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1} (:)
2021-12-23 10:42:05,553 [INFO][complexQueryExecutor2] [DDL_2.dn1] <exec_ddl_sql.get_conn> Get BackendConnection[id = 9 host = 10.186.63.8 port = 24801 localPort = 52423 mysqlId = 5924 db config = dbInstance[name=instanceM1,disabled=false,maxCon=10,minCon=3] (:)
2021-12-23 10:42:05,553 [INFO][complexQueryExecutor2] [DDL_2.dn2] <exec_ddl_sql.start> In shardingNode[dn2],about to execute sql{CREATE TABLE `tableB` (`id` int(11) DEFAULT NULL, `id2` int(11) DEFAULT NULL, `name` varchar(100) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1} (:)
2021-12-23 10:42:05,553 [INFO][complexQueryExecutor2] [DDL_2.dn2] <exec_ddl_sql.get_conn> Get BackendConnection[id = 11 host = 10.186.63.7 port = 24801 localPort = 52426 mysqlId = 3282 db config = dbInstance[name=instanceM2,disabled=false,maxCon=10,minCon=3] (:)
2021-12-23 10:42:05,554 [INFO][complexQueryExecutor2] [DDL_2.dn3] <exec_ddl_sql.start> In shardingNode[dn3],about to execute sql{CREATE TABLE `tableB` (`id` int(11) DEFAULT NULL, `id2` int(11) DEFAULT NULL, `name` varchar(100) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1} (:)
2021-12-23 10:42:05,554 [INFO][complexQueryExecutor2] [DDL_2.dn3] <exec_ddl_sql.get_conn> Get BackendConnection[id = 8 host = 10.186.63.8 port = 24801 localPort = 52424 mysqlId = 5925 db config = dbInstance[name=instanceM1,disabled=false,maxCon=10,minCon=3] (:)
2021-12-23 10:42:05,554 [INFO][complexQueryExecutor2] [DDL_2.dn4] <exec_ddl_sql.start> In shardingNode[dn4],about to execute sql{CREATE TABLE `tableB` (`id` int(11) DEFAULT NULL, `id2` int(11) DEFAULT NULL, `name` varchar(100) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1} (:)
2021-12-23 10:42:05,554 [INFO][complexQueryExecutor2] [DDL_2.dn4] <exec_ddl_sql.get_conn> Get BackendConnection[id = 10 host = 10.186.63.7 port = 24801 localPort = 52427 mysqlId = 3281 db config = dbInstance[name=instanceM2,disabled=false,maxCon=10,minCon=3] (:)
2021-12-23 10:42:05,581 [INFO][complexQueryExecutor4] [DDL_2.dn3] <exec_ddl_sql.succ> (:)
2021-12-23 10:42:05,581 [INFO][complexQueryExecutor2] [DDL_2.dn1] <exec_ddl_sql.succ> (:)
2021-12-23 10:42:05,583 [INFO][complexQueryExecutor2] [DDL_2.dn4] <exec_ddl_sql.succ> (:)
2021-12-23 10:42:05,604 [INFO][complexQueryExecutor2] [DDL_2.dn2] <exec_ddl_sql.succ> (:)
2021-12-23 10:42:05,605 [INFO][complexQueryExecutor2] [DDL_2] <exec_ddl_sql.succ> (:)
2021-12-23 10:42:05,606 [INFO][complexQueryExecutor2] [DDL_2] <update_table_metadata.start> (:)
2021-12-23 10:42:05,608 [INFO][complexQueryExecutor2] [DDL_2] <update_table_metadata> Start execute sql{show create table} in the shardingNodes[dn4] to get table[tableB]'s information (:)
2021-12-23 10:42:05,615 [INFO][complexQueryExecutor4] [DDL_2] <update_table_metadata> In shardingNode[dn4], fetching success. (:)
2021-12-23 10:42:05,616 [INFO][complexQueryExecutor4] [DDL_2] <update_table_metadata.succ> Successful to update table[testdb.tableB]metadata (:)
2021-12-23 10:42:05,616 [INFO][complexQueryExecutor2] [DDL_2] <notice_cluster_ddl_complete.start> Notify and wait for all instances to enter phase COMPLETE (:)
2021-12-23 10:42:05,735 [INFO][complexQueryExecutor2] [DDL_2] <notice_cluster_ddl_complete.succ> All instances have entered phase COMPLETE (:)
2021-12-23 10:42:05,735 [INFO][complexQueryExecutor2] [DDL_2] <release_table_lock.succ> (:)
2021-12-23 10:42:05,817 [INFO][complexQueryExecutor2] [DDL_2] <finish_ddl_trace> Execute success (:)
2021-12-23 10:42:05,817 [INFO][complexQueryExecutor2] ===== finish_ddl_trace [DDL_2] ===== (:)

```

**dbleN**

```

2021-12-23 10:47:21,358 [INFO][Curator-PathChildrenCache-4] [DDL_NOTIFIED] <receive_ddl_prepare> Received: initialize ddl{CREATE TABLE `tableB` (`id` int(11) DEFAULT NULL, `id2` int(11) DEFAULT NULL, `name` varchar(100) DEFAULT NULL) ENGINE=InnoDB DEFAULT CHARSET=latin1} of table[testdb.tableB] (:)
2021-12-23 10:47:21,358 [INFO][Curator-PathChildrenCache-4] [DDL_NOTIFIED] <add_table_lock.start> (:)
2021-12-23 10:47:21,358 [INFO][Curator-PathChildrenCache-4] [DDL_NOTIFIED] <add_table_lock.succ> (:)
2021-12-23 10:47:21,461 [INFO][Curator-PathChildrenCache-4] [DDL_NOTIFIED] <receive_ddl_complete> Received: ddl execute success notice for table[testdb.tableB] (:)
2021-12-23 10:47:21,461 [INFO][Curator-PathChildrenCache-4] [DDL_NOTIFIED] <update_table_metadata.start> (:)
2021-12-23 10:47:21,465 [INFO][Curator-PathChildrenCache-4] [DDL_NOTIFIED] <update_table_metadata> Start execute sql{show create table} in the shardingNodes[dn1,dn2,dn3,dn4] to get table[tableB]'s information (:)
2021-12-23 10:47:21,469 [INFO][complexQueryExecutor4] [DDL_NOTIFIED] <update_table_metadata> In shardingNode[dn1], fetching success. (:)
2021-12-23 10:47:21,469 [INFO][complexQueryExecutor7] [DDL_NOTIFIED] <update_table_metadata> In shardingNode[dn4], fetching success. (:)
2021-12-23 10:47:21,469 [INFO][complexQueryExecutor5] [DDL_NOTIFIED] <update_table_metadata> In shardingNode[dn3], fetching success. (:)
2021-12-23 10:47:21,470 [INFO][complexQueryExecutor5] [DDL_NOTIFIED] <update_table_metadata> In shardingNode[dn2], fetching success. (:)
2021-12-23 10:47:21,471 [INFO][complexQueryExecutor5] [DDL_NOTIFIED] <update_table_metadata.succ> Successful to update table[testdb.tableB]metadata (:)
2021-12-23 10:47:21,471 [INFO][complexQueryExecutor5] [DDL_NOTIFIED] <release_table_lock.succ> (:)

```

**dbleA**

```
cat dble.log | grep '[DDL_2' | grep '[DDL_NOTIFIED]'
```

## 2.32

3.22.0.0dble

### 2.32.1

#### 2.32.1.1

user.xml analysisUserdbGroupdbGroupdb.xmluser.xmluser.xml

```
<dble:user xmlns:dble="http://dble.cloud/" version="4.0">
 <managerUser name="man1" password="654321" maxCon="100"/>
 <shardingUser name="root" password="123456" schemas="testdb" readOnly="false" maxCon="20"/>
 <rwsplitUser name="rwsu1" password="123456" dbGroup="rwGroup" maxCon="20"/>
 <analysisUser name="analysisUser" password="123456" dbGroup="dbGroup3" blacklist="blacklist1" maxCon="20"/>
</dble:user>
```

1. user.xmlshardingUserdblesharding.xml(dble)sharding.xml
2. analysisUserdbGroup
3. dbGroupinstancedbGroupinstance

### 2.32.2

dbledbInstancerwSplitMode0db.xml

1. dbInstance
- 2.

#### 2.3.2.1 dbInstance

dbInstances

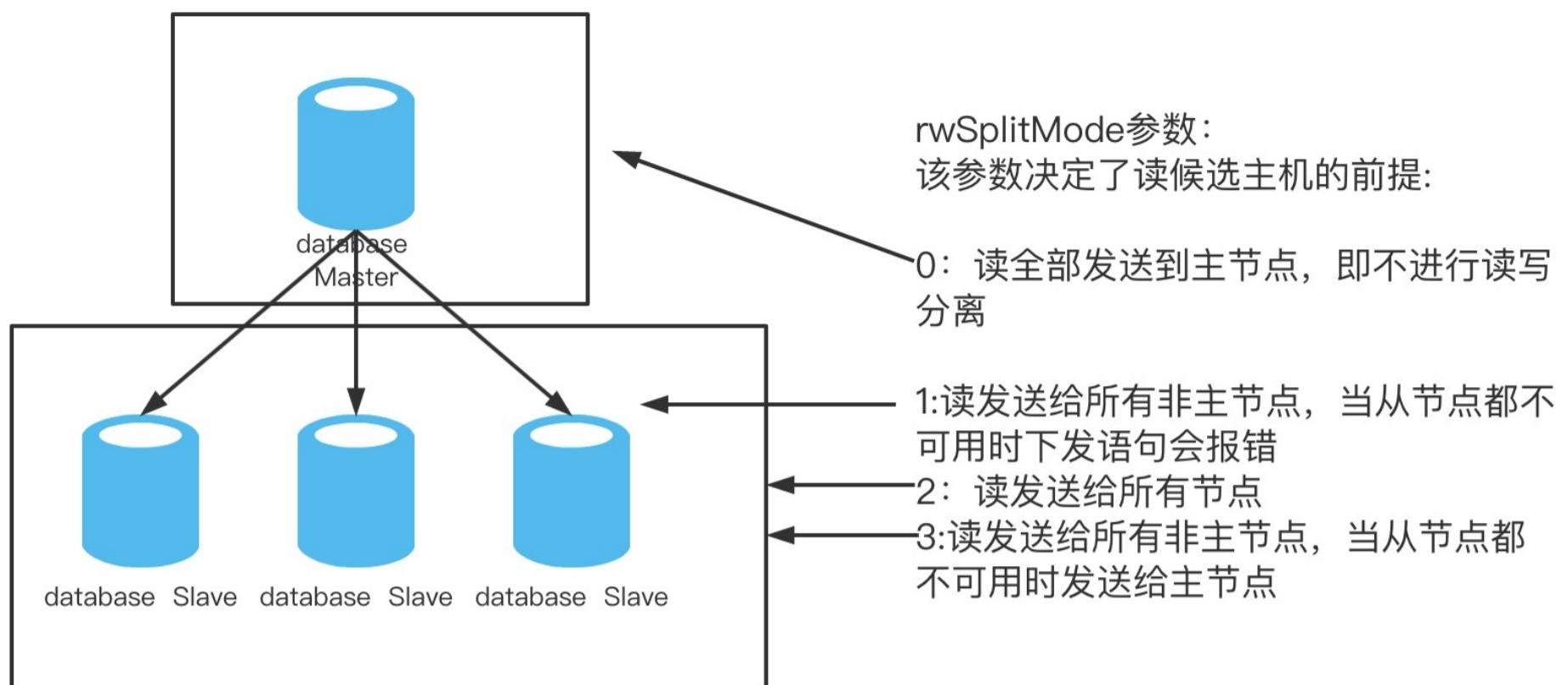
- (primary="true")
  - rwSplitMod2dbInstances
  - (primary primary="false")
    - dbInstances
    - dbInstances
- -

### 2.32.2.2

dbInstancedbInstance

- dbInstance
- dbInstance
  - dbInstance(readWeight), ,
  - dbInstance,

#### 2.32.2.3 dbGrouprwSplitMode



### 2.32.3

clickhousemysqlselectdbe

### 2.32.4

1. clickhouse
2. selectdbe
- 3.

## 2.23 hint

1:

```
table_a a left join table_b b on a.col_1 = b.col_1 left join table_c c on a.col_2 =c.col_2 where a.col =xxx
```

3.22.01.0:

1. a a.col=xxx
2. b
3. c

dblejoin b sqldble :

1. a
2. b a
3. c a

a b a col\_1 c a col\_2 b cdblejoindble

2:

```
table_a a left join table_b b on a.col_1 = b.col_1 left join table_c c on a.sharding_col = c.sharding_col where a.col =xxx
```

1 :

1. ac
2. b a col\_1

3:

```
table_a a left join table_b b on a.col_1 = b.col_1 left join table_c c on b.col_2 = c.col_2 where a.col =xxx
```

1

:

1. a
2. b a
3. c b

a b a col\_1 c b col\_2

:

1. a
2. b a
3. c

a b a col\_1 c

## hint

jdbc

```
import java.sql.*;
import java.util.*;
import java.util.concurrent.LinkedBlockingQueue;
import java.util.concurrent.ThreadPoolExecutor;
import java.util.concurrent.TimeUnit;
import java.util.concurrent.atomic.AtomicInteger;

public abstract class jdbctest {
 static AtomicInteger index = new AtomicInteger(0);
 static volatile Connection conn = null;
 private static List<Connection> list = new ArrayList<>();
 private static void createConn(String username, String password) {
 String JDBC_DRIVER = "com.mysql.jdbc.Driver";
 String url = "jdbc:mysql://127.0.0.1:8066/test1?useSSL=false";
 try {
 // JDBC
 Class.forName(JDBC_DRIVER);
```

```

 conn = DriverManager.getConnection(url, username, password);
 list.add(conn);
 } catch (Exception e) {
 e.printStackTrace();
 }
}

private static void createTable() {
 Statement stmt;
 try {
 // JDBC
 Connection conn = list.get(index.incrementAndGet());
 stmt = conn.createStatement();
 stmt.addBatch("drop table if EXISTS t_spec_group ;");
 stmt.addBatch("drop table if EXISTS t_spu ;");
 stmt.addBatch("drop table if EXISTS t_sku ;");
 stmt.addBatch("drop table if EXISTS t_warehouse_sku ;");
 stmt.executeBatch();
 stmt.addBatch("create table t_spec_group(" +
 " id int unsigned primary key comment ''," +
 " spg_id int unsigned not null comment 'ID','" +
 " `type` varchar(200) not null comment ''," +
 " `name` varchar(200) not null comment '''" +
 ") comment ='';");
 stmt.addBatch("create table t_spu(" +
 " id int unsigned primary key comment ''," +
 " title varchar(200) not null comment ''," +
 " category_id int unsigned not null comment 'ID','" +
 " saleable int unsigned not null comment ''," +
 " spg_id int unsigned comment 'ID'" +
 ") comment ='';");
 stmt.addBatch("create table t_sku(" +
 " id int unsigned primary key comment ''," +
 " spu_id int unsigned not null comment 'ID','" +
 " spg_id int unsigned not null comment 'ID','" +
 " title varchar(200) not null comment ''," +
 " price int unsigned not null comment '''" +
 ") comment ='';");
 stmt.addBatch("create table t_warehouse_sku(" +
 " warehouse_id int unsigned comment ''," +
 " sku_id int unsigned comment 'ID','" +
 " spg_id int unsigned not null comment 'ID','" +
 " title varchar(200) not null comment ''," +
 " type varchar(200) comment ''," +
 " num int unsigned not null comment '''" +
 ") comment ='';");
 stmt.executeBatch();
 stmt.clearBatch();
 System.out.println("-----end-----");
 } catch (Exception e) {
 e.printStackTrace();
 }
}

private static void insertSpec_group() {
 PreparedStatement ps = null;
 try {
 Connection conn = list.get(index.incrementAndGet());
 String sql = "INSERT INTO t_spec_group (id, spg_id, type, name) VALUES (?,?,?,?);";
 ps = conn.prepareStatement(sql);
 int size = 300;
 for (int i = 0; i < size; i++) {

 if (i < 200) {
 ps.setInt(1, i);
 ps.setInt(2, i + 2000000);
 ps.setString(3, "phone");
 ps.setString(4, "iphone" + i);
 } else {
 ps.setInt(1, i);
 ps.setInt(2, i);
 ps.setString(3, "desk" + i);
 ps.setString(4, "idesk" + i);
 }
 ps.addBatch();
 if (i % 500 == 0) {
 //
 }
 }
 } catch (SQLException e) {
 e.printStackTrace();
 }
}

```

```

 ps.executeBatch();
 // sql
 ps.clearBatch();
 }
}

ps.executeBatch();
// sql
ps.clearBatch();
System.out.println("-----insertSpec_group---end-----");
} catch (Exception e) {
 e.printStackTrace();
}
}

private static void insertT_spu() {
 PreparedStatement ps = null;
 try {
 Connection conn = list.get(index.incrementAndGet());
 String sql = "INSERT INTO t_spu (id, title, category_id,saleable,spg_id) VALUES (?, ?, ?, ?, ?);";
 ps = conn.prepareStatement(sql);
 int size = 1000000;
 for (int i = 0; i < size; i++) {
 ps.setInt(1, i);
 if (i < 200) {
 ps.setString(2, "this is phone");
 ps.setInt(5, i + 2000000);
 } else {
 ps.setString(2, "this is desk" + i);
 ps.setInt(5, i);
 }
 ps.setInt(3, i);
 ps.setInt(4, 1);

 ps.addBatch();
 if (i % 500 == 0) {
 //
 ps.executeBatch();
 // sql
 ps.clearBatch();
 }
 }
 ps.executeBatch();
 // sql
 ps.clearBatch();
 System.out.println("-----insertT_spu---end-----");
 } catch (Exception e) {
 e.printStackTrace();
 }
}

private static void insertT_sku() {
 PreparedStatement ps = null;
 try {
 Connection conn = list.get(index.incrementAndGet());
 String sql = "INSERT INTO t_sku (id, spu_id,spg_id,title,price) VALUES (?, ?, ?, ?, ?);";
 ps = conn.prepareStatement(sql);
 int size = 1000000;
 for (int i = 0; i < size; i++) {
 ps.setInt(1, i);
 ps.setInt(2, i);

 if (i < 200) {
 ps.setInt(3, i + 2000000);
 ps.setString(4, "iphone" + i);
 } else {
 ps.setInt(3, i);
 ps.setString(4, "idesk" + i);
 }
 ps.setInt(5, new Random().nextInt(2000));
 ps.addBatch();
 if (i % 500 == 0) {
 //
 ps.executeBatch();
 // sql
 ps.clearBatch();
 }
 }
 }
}

```

```

 ps.executeBatch();
 // sql
 ps.clearBatch();
 System.out.println("----- insertT_sku---end-----");
 } catch (Exception e) {
 e.printStackTrace();
 }
}

private static void insertT_warehouse_sku() {
 PreparedStatement ps = null;
 try {
 Connection conn = list.get(index.incrementAndGet());
 String sql = "INSERT INTO t_warehouse_sku (warehouse_id, sku_id,spg_id, title,type, num) VALUES (?, ?,?,?,?,?,?)";
 ps = conn.prepareStatement(sql);
 int size = 1000000;
 for (int i = 0; i < size; i++) {
 ps.setInt(1, i);
 ps.setInt(2, i);
 if(i < 200){

 ps.setInt(3, i + 2000000);
 ps.setString(4, "iphone" + i);
 ps.setString(5, "phone");
 }else {
 ps.setInt(3, i);
 ps.setString(4, "idesk" + i);
 ps.setString(5, "desk");
 }
 ps.setInt(6, new Random().nextInt(200));
 ps.addBatch();
 if (i % 500 == 0) {
 //
 ps.executeBatch();
 // sql
 ps.clearBatch();
 }
 }
 ps.executeBatch();
 // sql
 ps.clearBatch();
 System.out.println("-----insertT_warehouse_sku---end-----");
 } catch (Exception e) {
 e.printStackTrace();
 }
}

public static void main(String[] args) throws InterruptedException {
 int size = 6;
 //user.xml
 String username = "aa";
 String password = "123456";
 ThreadPoolExecutor executor = new ThreadPoolExecutor(size, size, 60, TimeUnit.SECONDS, new LinkedBlockingQueue<>());
 for (int i = 0; i < size; i++) {
 createConn(username, password);
 }
 createTable();
 executor.execute(() -> insertSpec_group());
 executor.execute(() -> insertT_warehouse_sku());
 executor.execute(() -> insertT_sku());
 executor.execute(() -> insertT_spu());
}

```

sharding.xml

```
<?xml version="1.0"?>
<!DOCTYPE dble:sharding SYSTEM "sharding.dtd">
<dble:sharding xmlns:dble="http://dble.cloud/">
 <schema name="test1" >
 <shardingTable name="t_spec_group" shardingNode="dn1,dn2" function="sql-mod" shardingColumn="id"></shardingTable>
 <shardingTable name="t_spu" shardingNode="dn1,dn2" function="sql-mod" shardingColumn="id"></shardingTable>
 <shardingTable name="t_sku" shardingNode="dn1,dn2" function="hash-string-into-two" shardingColumn="title"></shardingTable>
 <shardingTable name="t_warehouse_sku" shardingNode="dn1,dn2" function="hash-string-into-two" shardingColumn="title"></shardingTable>
 </schema>
</dble:sharding>
```

```

<shardingNode dbGroup="dbGroup1" database="db1" name="dn1"/>
<shardingNode dbGroup="dbGroup2" database="db1" name="dn2"/>
<shardingNode dbGroup="dbGroup3" database="db1" name="dn3"/>
<shardingNode dbGroup="dbGroup4" database="db1" name="dn4"/>

<function name="hash-string-into-two" class="StringHash">
 <property name="partitionCount">2</property>
 <property name="partitionLength">1</property>
</function>

<function name="sql-mod" class="Hash">
 <property name="partitionCount">2</property>
 <property name="partitionLength">1</property>
</function>

</dble:sharding>
```

db.xml

```

<?xml version="1.0"?>
<!--
 ~ Copyright (C) 2016-2020 ActionTech.
 ~ License: http://www.gnu.org/licenses/gpl.html GPL version 2 or higher.
-->
<!DOCTYPE dble:db SYSTEM "db.dtd">
<db:db xmlns:db="http://dble.cloud/" version="4.0">
 <dbGroup name="dbGroup1" rwSplitMode="0" delayThreshold="10000" >
 <heartbeat timeout="30" >show slave status</heartbeat>
 <dbInstance name="M1" url="ip1:3306" user="root" password="123456" maxCon="300" minCon="10" id="100"
 primary="true" >
 </dbInstance>
 </dbGroup>

 <dbGroup name="dbGroup2" rwSplitMode="0" delayThreshold="10000" >
 <heartbeat>show slave status</heartbeat>
 <dbInstance name="M2" url="ip2:3306" user="root" password="123456" id="1" maxCon="2000" minCon="10"
 primary="true" >
 </dbInstance>
 </dbGroup>

 <dbGroup name="dbGroup3" rwSplitMode="0" delayThreshold="10000" >
 <heartbeat errorRetryCount="1" timeout="10">show slave status</heartbeat>
 <dbInstance name="M3" url="ip3:3306" user="root" password="123456" id="1" maxCon="2000" minCon="10"
 primary="true" >
 </dbInstance>
 </dbGroup>

 <dbGroup name="dbGroup4" rwSplitMode="2" delayThreshold="10000" >
 <heartbeat errorRetryCount="1" timeout="10">show slave status</heartbeat>
 <dbInstance name="M4" user="root" password="123456" url="ip4:3306" maxCon="20" minCon="10"
 primary="true" >
 </dbInstance>
 </dbGroup>
</db:db>
```

## where

```
select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on b.spg_id=c.spg_id where a.type = 'phone';
```

hint

1. a
2. b
3. c

hint

```
/*!dble:plan=a & b & c */ select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on b.spg_id=c.spg_id where a.type = 'phone';
```

hint a &amp; b &amp; c

1. a
2. ba
3. cab

hint

```
select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone';
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=a & b & c */ select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone';
```

hint a & b & c

1. a
2. ba
3. cab

hint

hint

```
/*!dbe:plan=a & (b | c) */ select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone';
```

hint a & (b | c)

1. a
2. bac

abchint

```
select * from t_warehouse_sku a inner join t_sku b on a.sku_id = b.id inner join t_spec_group c on b.spg_id=c.spg_id where a.type = 'phone';
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=a & b & c */ select * from t_warehouse_sku a inner join t_sku b on a.sku_id = b.id inner join t_spec_group c on b.spg_id=c.spg_id where a.type = 'phone';
```

hint a & b & c

1. a
2. ba
3. cab

hint

hint

```
/*!dbe:plan=a & b | c */ select * from t_warehouse_sku a inner join t_sku b on a.sku_id = b.id inner join t_spec_group c on b.spg_id=c.spg_id where a.type = 'phone';
```

hint a & b | c

1. ac
2. ba

acbhint

```
select * from t_warehouse_sku a inner join t_sku b on a.sku_id = b.id inner join t_spec_group c on a.spg_id=c.spg_id where a.type = 'phone';
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=a & b & c */ select * from t_warehouse_sku a inner join t_sku b on a.sku_id = b.id inner join t_spec_group c on a.spg_id=c.spg_id where a.type = 'phone';
```

hint a &amp; b &amp; c

1. a
2. ba
3. cab

hint

hint

```
/*!dbe:plan=a & (b | c) */ select * from t_warehouse_sku a inner join t_sku b on a.sku_id = b.id inner join t_spec_group c on a.spg_id=c.spg_id where a.type = 'phone';
```

hint a &amp; (b | c)

1. a
2. ba,ca

abchint

hint

```
/*!dbe:plan=a & b | c */ select * from t_warehouse_sku a inner join t_sku b on a.sku_id = b.id inner join t_spec_group c on a.spg_id=c.spg_id where a.type = 'phone';
```

hint a &amp; b | c

1. ac
2. ba

acbhint

```
select * from t_warehouse_sku a inner join t_spu b on a.spg_id = b.spg_id inner join t_sku c on a.title=c.title where a.type = 'phone';
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=(a,c) & b*/ select * from t_warehouse_sku a inner join t_spu b on a.spg_id = b.spg_id inner join t_sku c on a.title=c.title where a.type = 'phone';
```

hint (a,c) &amp; b

1. ac
2. ba

hint

```
select * from t_warehouse_sku a inner join t_spec_group b on a.spg_id = b.spg_id inner join t_sku c on a.title=c.title where a.type = 'phone';
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=(a,c) & b*/ select * from t_warehouse_sku a inner join t_spec_group b on a.spg_id = b.spg_id inner join t_sku c on a.title=c.title where a.type = 'phone';
```

hint (a,c) & b

1. ac
2. ba

hint

hint

```
/*!dbe:plan=(a,c) | b*/ select * from t_warehouse_sku a inner join t_spec_group b on a.spg_id = b.spg_id inner join t_sku c on a.title=c.title where a.type = 'phone';
```

hint (a,c) | b

1. ac,b

acbhint

```
select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone' and b.category_id < 200;
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=a & b & c */ select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone' and b.category_id < 200;
```

hint a & b & c

1. a
2. bawhere
3. cab

hint

hint

```
/*!dbe:plan=a & (b | c) */ select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone' and b.category_id < 200;
```

hint a & (b | c)

1. a
2. bawhere
3. ca

abc,hint

```
select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone' and c.title like 'iphone%';
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=a & b & c */ select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone' and c.title like 'iphone%';
```

hint a & b & c

1. a
2. ba
3. cabwhere

hint

hint

```
/*!dbe:plan=a & (b | c) */ select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone' and c.title like 'iphone%';
```

hint a & (b | c)

1. a
2. ba
3. cawhere

abc,hint

hint

```
/*!dbe:plan=a & b | c */ select * from t_warehouse_sku a left join t_spu b on a.spg_id = b.spg_id left join t_sku c on a.sku_id=c.id where a.type = 'phone' and c.title like 'iphone%';
```

hint a & b | c

1. a,c,
2. ba

acb,hint

## where

```
select * from t_spec_group a inner join t_spu b on a.spg_id = b.spg_id inner join t_sku c on b.spg_id=c.spg_id;
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=a & b & c */ select * from t_spec_group a inner join t_spu b on a.spg_id = b.spg_id inner join t_sku c on b.spg_id=c.spg_id ;
```

hint a & b & c

1. a
2. ba
3. cab

hint

```
select * from t_spec_group a inner join t_spu b on a.spg_id = b.spg_id inner join t_sku c on a.spg_id=c.spg_id;
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=a & b & c */ select * from t_spec_group a inner join t_spu b on a.spg_id = b.spg_id inner join t_sku c on a.spg_id=c.spg_id ;
```

hint a & b & c

1. a
2. ba
3. cab

hint

hint

```
/*!dbe:plan=a & (b | c) */ select * from t_spec_group a inner join t_spu b on a.spg_id = b.spg_id inner join t_sku c on a.spg_id=c.spg_id;
```

hint a & ( b | c )

1. a
2. baca

ahint

```
select * from t_spec_group a inner join t_warehouse_sku b on a.spg_id = b.spg_id left join t_sku c on b.title=c.title;
```

hint

1. a
2. b
3. c

hint

```
/*!dbe:plan=(b,c) & a */ select * from t_spec_group a inner join t_warehouse_sku b on a.spg_id = b.spg_id left join t_sku c on b.title=c.title;
```

hint (b,c) & a

1. bc
2. ab

bcer,hint

hint

```
/*!dbe:plan=(b,c) | a */ select * from t_spec_group a inner join t_warehouse_sku b on a.spg_id = b.spg_id inner join t_sku c on b.title=c.title;
```

hint (b,c) | a

1. bc
2. ab

bcerahint

## hint

dbledble 3.22.01.Odbleshint

hint [dbe hint](#)

```
/*!dbe:plan=a & (b | c)$left2inner$right2inner$in2join$use_table_index*/ sql
```

a & ( b | c ) abc sql

&|

- 1: a & ( b | c )
- 2: (a,c) & b
- 3: a&b&c ( a & b ) | c

1. (a,c) acER

2. & nestloop

3. | join

4. left2inner left joininner join

5. right2inner right joininner join
6. in2join injoinbootstrap.cnfinSubQueryTransformToJoin

sql dble use\_table\_index sql

```
/*!dbe:plan=1 & 2 & 3 $use_table_index*/ select * from t1 a left join t2 b on a.id = b.id left join t3 c on a.id=c.id
```

1 a2 b3 c123 sql

```
/*!dbe:plan=a & b & c*/ select * from t1 a left join t2 b on a.id = b.id left join t3 c on a.id=c.id
```

## hintnestLoop

- hint  
a join b ,a,berhinta & b,
- hint  
a join b on a.col1 = b.col1 join c on c.col2 = a.col2, hint ( a & b & c),

1. Hibernate
2. sql join key hint      `select * from table_a a, table_b b`
3. sql right join hint
4. sql hint
5. left join inner join      `/*!dbe:plan=a & c & b */ SELECT * FROM Employee a LEFT JOIN Dept b on a.name=b.manager inner JOIN Info c on a.name=c.name and b.manager=c.name ORDER BY a.name; a c inner join , b join a b left join c b inner joinsql`
6. sqlerhint  
`hintdblesqlhint /*!dbe:plan=a | c | b */ SELECT a.Name,a.DeptName,b.Manager,c.salary FROM Employee a LEFT JOIN Dept b on a.DeptName=b.DeptName LEFT JOIN Level c on a.Level=c.levelname and c.salary=10000 order by a.Name ; SELECT a.Name,a.DeptName,b.Manager,c.salary FROM Employee a LEFT JOIN Level c on a.Level=c.levelname and c.salary=10000 LEFT JOIN Dept b on a.DeptName=b.DeptName order by a.Name ,acererhintnestLoop,`

## 2.34 dble

dble

MySQLdbleTLSMySQL ClientMySQLDBLE

- [2.34.1 SSL](#)
- [2.34.2 DBLESSL](#)

## 2.34.1 SSL

MySQLCACADBSSL

ca.pem	CA
server-cert.pemserver-key.pem	java
client-vert.pemclient-key.pem	java
truststore.jks	CAJKSjava
serverkeystore.jks	JKSjava
clientkeystore.jks	JKSjava

MySQL[ca.pem]CA[server-cert.pem] [client-cert.pem] [ca.pem]

openssl

yumyum install openssl -y

```

1CA()
CA [ca-key.pem]
openssl genrsa 2048 > ca-key.pem
[ca.pem]
openssl req -new -x509 -nodes -days 3600 -key ca-key.pem -out ca.pem

2
[server-key.pem][server-req.pem]
openssl req -newkey rsa:2048 -days 3600 -nodes -keyout server-key.pem -out server-req.pem
RSA
openssl rsa -in server-key.pem -out server-key.pem
CA[server-cert.pem], CA
openssl x509 -req -in server-req.pem -days 3600 -CA ca.pem -CAkey ca-key.pem -set_serial 01 -out server-cert.pem

3
[client-key.pem][client-req.pem]
openssl req -newkey rsa:2048 -days 3600 -nodes -keyout client-key.pem -out client-req.pem
RSA
openssl rsa -in client-key.pem -out client-key.pem
CA[client-cert.pem], CA
openssl x509 -req -in client-req.pem -days 3600 -CA ca.pem -CAkey ca-key.pem -set_serial 01 -out client-cert.pem

40K
openssl verify -CAfile ca.pem server-cert.pem client-cert.pem

5
openssl x509 -text -in ca.pem
openssl x509 -text -in server-cert.pem
openssl x509 -text -in client-cert.pem

```

openssl pem crt Java keytool p12 jks

keytool JAVA keytool keystore/

```

1CAJKS
#[ca.pem]Java java JKS JCE KSPKCS12PKCS11DKSJKStruststore.jks 123456
keytool -import -noprompt -file ca.pem -keystore truststore.jks -storepass 123456

2JKS
#[server-cert.pem][server-key.pem]()p12JKS123456
openssl pkcs12 -export -in server-cert.pem -inkey server-key.pem -out serverkeystore.p12 -passout pass:123456
keytool -importkeystore -srckeystore serverkeystore.p12 -srcstoretype PKCS12 -destkeystore serverkeystore.jks -srcstorepass 123456 -de
ststorepass 123456

```

**3JKS**

```
#[client-cert.pem][client-key.pem]()p12JKS123456
openssl pkcs12 -export -in client-cert.pem -inkey client-key.pem -out clientkeystore.p12 -passout pass:123456
keytool -importkeystore -srckeystore clientkeystore.p12 -srcstoretype PKCS12 -destkeystore clientkeystore.jks -srcstorepass 123456 -de
ststorepass 123456
```

## 2.34.2 DBLESSL

### DBLE

#### bootstrap.cnf

```
-DsupportSSL=true
-DserverCertificateKeyStoreUrl=${JKS}
-DserverCertificateKeyStorePwd={}
-DtrustCertificateKeyStoreUrl=${CAJKS}
-DtrustCertificateKeyStorePwd={}
```

### 9066

```
mysql> select * from dble_variables where comment like '%SSL%';
+-----+-----+
| variable_name | variable_value | comment
| read_only |
+-----+-----+
|-----+-----+
| isSupportSSL | true | Whether support for SSL to establish front
tend connections | true |
| serverCertificateKeyStoreUrl | ${JKS} | Service certificate required for SSL | true
|-----+-----+
| trustCertificateKeyStoreUrl | ${CAJKS} | Trust certificate required for SSL
| true |
+-----+-----+
-----+
3 rows in set (0.07 sec)
```

:isSupportSSLfalse\$!dble.logssl

### SSL

#### MySQLSSLDLBE

- ssl-mode=DISABLED

Client

```
client mysql -u*** -p*** --ssl-mode=DISABLED
jdbc jdbc:mysql://localhost:8066/testdb?useSSL=false
```

- ssl-mode=PREFERRED

client

```
client mysql -u*** -p*** --ssl-mode=PREFERRED
jdbc jdbc:mysql://localhost:8066/testdb?requireSSL=false&useSSL=true&verifyServerCertificate=false
```

- ssl-mode=REQUIRED

ClientClient

```
client mysql -u*** -p*** --ssl-mode=REQUIRED
jdbc jdbc:mysql://localhost:8066/testdb?requireSSL=true&useSSL=true&verifyServerCertificate=false
```

- ssl-mode=VERIFY\_CA

◦

Clientca

```
client mysql -u*** -p*** --ssl-mode=VERIFY_CA --ssl-ca='${CA}'
```

jdbc

```
jdbc:mysql://localhost:8066/testdb?
requireSSL=true
&useSSL=true
&verifyServerCertificate=true
```

```
&trustCertificateKeyStoreUrl=file:${CAJKS}
&trustCertificateKeyStorePassword=${CAJKS}
```

- 

#### Clientca

```
client mysql -u*** -p*** --ssl-mode=VERIFY_CA --ssl-ca='${CA}' --ssl-cert='${}' --ssl-key='${}'
```

#### jdbc

```
jdbc:mysql://localhost:8066/testdb?
requireSSL=true
&useSSL=true
&verifyServerCertificate=true
&trustCertificateKeyStoreUrl=file:${CAJKS}
&trustCertificateKeyStorePassword=${CAJKS}
&clientCertificateKeyStoreUrl=file:${JKS}
&clientCertificateKeyStorePassword=file:${JKS}
```

- ssl-mode=VERIFY\_IDENTITY()

#### VERIFY\_CA

- MYSQL CLIENT

```
mysql> \s
...
SSL: Cipher in use is DHE-RSA-AES256-SHA # SSL
...
```

- DBLE

- ssl=OpenSSLOpenSSL

```
2022-05-26 11:27:55,557 [INFO][BusinessExecutor4] FrontendConnection[id = 3 port = 8066 host = 127.0.0.1 local_port = 57752 isManager = false startupTime = 1653535675511 skipCheck = false isFlowControl = false onlyTcpConnect = false ssl = OpenSSL] SSL handshake complete (SSLHandler.java:248)
```

- ssl=no

```
2022-05-26 11:32:37,908 [INFO][BusinessExecutor2] connection id close for reason [quit cmd] with connection FrontendConnection[id = 4 port = 8066 host = 192.168.0.109 local_port = 58114 isManager = false startupTime = 1653535957751 skipCheck = false isFlowControl = false onlyTcpConnect = false ssl = no] (AbstractConnection.java:154)
```

## 2.35

### 2.35.1

```
>=3.22.11.0
```

dble direct memory()io dble

dble dble

direct memory MB

```
direct memory show @@directmemory DIRECT_MEMORY_POOL_USED
```

20%cpu20%

buffer

### 2.35.2

dble\_memory\_resident id

### 2.35.3 bootstrap.cnf

```
whether enable the memory buffer monitor
#-DenableMemoryBufferMonitor=0
#-DenableMemoryBufferMonitorRecordPool=1
```

### 2.35.4

#### 2.35.4.1 enable @@memory\_buffer\_monitor

```
mysql> enable @@memory_buffer_monitor;
Query OK, 1 row affected (4.26 sec)
```

#### 2.35.4.2 disable @@memory\_buffer\_monitor

```
mysql> disable @@memory_buffer_monitor;
Query OK, 1 row affected (0.01 sec)
disable MemoryBufferMonitor success
```

#### 2.35.4.3 select \* from dble\_memory\_resident \G

buffer

buffer 1s buffer

```
mysql> select * from dble_memory_resident \G
***** 1. row *****
 id: 140185807364096
 alive_second: 29.892
 stacktrace:
com.actiontech.dble.buffer.MemoryBufferMonitor.addRecord(MemoryBufferMonitor.java:80)
com.actiontech.dble.buffer.DirectByteBufferPool.allocate(DirectByteBufferPool.java:58)
com.actiontech.dble.net.connection.AbstractConnection.allocate(AbstractConnection.java:431)
com.actiontech.dble.net.connection.AbstractConnection.findReadBuffer(AbstractConnection.java:529)
com.actiontech.dble.net.connection.FrontendConnection.findReadBuffer(FrontendConnection.java:358)
```

```
com.actiontech.dble.net.impl.nio.NIOSocketWR.asyncRead(NIOSocketWR.java:358)
com.actiontech.dble.services.mysqlauthenticate.MySQLFrontAuthService.register(MySQLFrontAuthService.java:61)
com.actiontech.dble.net.connection.AbstractConnection.register(AbstractConnection.java:601)

buffer_type: POOL
allocate_size: 4096
allocate_time: 2022-12-07 17:21:39.901
 sql: <<FRONT>>
1 row in set (0.00 sec)
```

## 2.35.5

buffer\_type=NORMAL , sql

```
mysql> select * from dble_memory_resident where buffer_type="NORMAL"\G
Empty set (0.02 sec)
```

- sql alive\_second
- sql alive\_second buffer dble
- sql DIRECT\_MEMORY\_POOL\_USED
- sql DIRECT\_MEMORY\_POOL\_USED dble\_memory\_residentdble

## 2.36

dblesalvedbInstancesalvedbInstance

### 2.36.1

db.xmldelayThresholddelayPeriodMillisdelayDatabasedb.xml

```

<dbGroup name="dbGroup1" rwSplitMode="1" delayThreshold="1000" delayPeriodMillis="2000" delayDatabase="test">
 <heartbeat errorRetryCount="1" timeout="10" keepAlive="60">show slave status</heartbeat>
 <dbInstance name="instanceM1" url="ip5:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="true">
 </dbInstance>

 <!-- can have multi read instances -->
 <dbInstance name="instanceS1" url="ip6:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="false">
 <property name="heartbeatPeriodMillis">60000</property>
 </dbInstance>
 </dbGroup>

```

1.delayPeriodMillisdelayDatabasedelayThresholddelayThreshold

2.rwStickyTime

3.

### 2.36.2

1.dbleprimary="true"mysqlu\_delay

```

create table if not exists delaydatabase.u_delay(
source VARCHAR(256) NOT NULL,
real_timestamp varchar(26) NOT NULL,
logic_timestamp BIGINT default 0);

```

Source :dbledble\_dbGgroupName\_instanceNameinstanceName-DinstanceName

real\_timestamp:dble dble

logic\_timestamp:dble

2.delayPeriodMillismaster-mysqlreplace into

3.delayPeriodMillisslave-mysqlselect

4.slave-mysqllogic_timestampmaster-mysqllogic_timestamp	delayPeriodMillis > delayThresholdslave-mysqldbInstance	delayPeriodMillis < delayThresholdsl
dbInstancesslave-mysqldbInstanceslave-mysqldbInstance		

#### 2.36.2.1

masterlogic\_timestampslavelogic\_timestamp\*delayPeriodMillis

### 2.36.3

delay\_detection

```

+-----+-----+-----+-----+-----+-----+-----+
| db_group_name | name | host | delay | status | message | last_active_time | backend_conn_id | logic_upda
te |
+-----+-----+-----+-----+-----+-----+-----+
| dbGroup1 | M1 | 10.186.62.41:3312 | 0 | ok | NULL | 2022-12-09 15:09:45 | 293 |
| dbGroup1 | S1 | 10.186.62.41:3309 | 0 | ok | NULL | 2022-12-09 15:09:45 | 295 |
+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

```

db\_group\_namedbGroup

name:dbInstanceName

hostmysql ip

delay:

status:okerrorinit(timeout())

```
messageok
last_active_time:
backend_conn_idid
logic_update:
logic_updatemysql
```

```
update delay_detection set logic_update = 1 where backend_conn_id = 26;
```

## 2.37 /sql\_dump log

### 2.37.1

0SQLDBLE

### 2.37.2

```
[[SQL digest hash][SQL][ID][][][IP:][IP:][] SQL
```

- []
- [SQL digest hash] SQLhash
- [SQL] SQLInsertUpdateDeleteSelectShowDDLBeginCommitRollbackOther
- [ID]ID
- []
- [](:)
- [IP:]IPPORT
- [IP:]IPPORT
- []SQL
- SQLSQL1024

### 2.37.3

```
-DenableSqlDumpLog=0 # 0-()1-
-DsqlDumpLogBasePath=sqldump # base
-DsqlDumpLogFileName=sqldump.log # sqldump/sqldump.log
-DsqlDumpLogCompressFilePattern=${date:yyyy-MM}/sqldump-%d{MM-dd}-%i.log.gz ## sqldump/2022-10/sqldump-10-11-1.log.gz
-DsqlDumpLogOnStartupRotate=1 # 1-0-
-DsqlDumpLogSizeBasedRotate=50MB # sqldump.log50MB:KBMBGB
-DsqlDumpLogTimeBasedRotate=1 # 1
-DsqlDumpLogDeleteFileAge=90d # 90:d()h()m()s()sqlDumpLogCompressFilePatternlog4j2

-DsqlDumpLogCompressFilePath=/sqldump-* .log.gz #
```

### 2.37.4

```
enable @@sqldump_sql; --
disable @@sqldump_sql; --
select * from dble_variables where variable_name like '%sqldump%'; -- sqldump
```

### 2.37.5

```
0SQLDBLE
1ExitQuit
3COM_STMT_PREPARE COM_STMT_EXECUTE
4
5DBLEDruidDruidsql“SQL”“Other”
6log4j2
```

## 2.38 tcp

### 2.38.1

dblemysqltcpmysql dbledbldblelinuxkeep-alive dblebootstrap.cnf dble

### 2.38.2 jdk

oracle jdk 1.8-261  
openjdk 1.8-272

### 2.38.3

```
-DtcpKeepIdle=30 #tcp-keepalive
-DtcpKeepInterval=10 #tcp-keepalive
-DtcpKeepCount=3 #tcp-keepalive
```

### 2.38.4

1.tcp  
2.  
3.NAT

### 2.38.5

1.dblejdkdblewarndble  
2.tcpKeepIdle tcpKeepInterval tcpKeepCount

## 2.39 HTAP

### 2.39.1

MySQL MySQL  
DBLE OLTP MySQL OLAP Clickhouse TP/AP DBLE SQL SQL TP MySQL Clickhouse TP/AP

### 2.39.2

#### 1. user.xml HTA Hybrid TA User

```
<hybridTAUser name="htap_user1" password="111111" schemas="testdb"/>
```

#### 2. sharding.xml hybrid TA User schema

```
<!--apNodeClickhouseShardingNodeMySQL-->
<schema name="testdb" apNode="apNode1" shardingNode="dn1">
 ...
</schema>
<shardingNode name="dn1" dbGroup="dbGroup1" database="db_1"/>
<apNode name="apNode1" dbGroup="dbGroup2" database="ap_db1"/>
```

#### 3. db.xml HTAP MySQL Clickhouse

```
<!--MySQL-->
<dbGroup name="dbGroup1" rwSplitMode="0" delayThreshold="100">
 <heartbeat>select 1</heartbeat>
 <dbInstance name="hostM1" url="ip:port" user="root" password="123456" maxCon="100" minCon="10" primary="true"/>
</dbGroup>
<!--Clickhouse-->
<dbGroup name="dbGroup2" rwSplitMode="0" delayThreshold="100">
 <heartbeat>select 1</heartbeat>
 <dbInstance name="hostM2" url="ip:port" user="default" password="123456" maxCon="100" minCon="10" primary="true" databaseType="clickhouse"/>
</dbGroup>
```

#### 4. Clickhouse binlog Materialized MySQL

#### 1. shardingUser schema apNode

#### 2. hybridTAUser schema apNode

#### 3. hybridTAUser apNode dbGroup databaseType clickhouse

#### 4. analysisUser dbGroup hybridTAUser apNode

#### 5. shardingNode apNode name

### 2.39.3

MySQL Clickhouse

```
mysql> select * from table_1;
+----+-----+
| id | column1 |
+----+-----+
| 1 | abc |
| 2 | def |
| 3 | ghi |
+----+-----+
3 rows in set (0.01 sec)
```

case 1: OLTP

```
#SQLAOLTPdnMySQL
mysql> explain select id from table_1;
+-----+-----+-----+
| SHARDING_NODE | TYPE | SQL/REF |
+-----+-----+-----+
| dn1 | BASE SQL | select id from table_1 |
| dn2 | BASE SQL | select id from table_1 |
| dn3 | BASE SQL | select id from table_1 |
| dn4 | BASE SQL | select id from table_1 |
+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> select id from table_1;
+---+
| id |
+---+
| 3 |
| 1 |
| 2 |
+---+
3 rows in set (0.01 sec)
```

case 2: OLAP

```
#SQLgroup byOLAPap1Clickhouse
mysql> explain select id from table_1 group by id;
+-----+-----+-----+
| SHARDING_NODE | TYPE | SQL/REF |
+-----+-----+-----+
| ap1 | BASE SQL | select id from table_1 group by id |
+-----+-----+-----+
1 row in set (0.00 sec)

mysql> select id from table_1 group by id;
+---+
| id |
+---+
| 3 |
| 2 |
| 1 |
+---+
3 rows in set (0.01 sec)
```

## 2.39.4

### SQL

SQLSQLAPTP

1. SELECTAP
 

```
minsumcountavgmaxSTDDEV_POPSTDDEV_SAMPVAR_POPVAR_SAMPgroup by
```
2. ClickHouseTP
3. ClickhousebinlogmysqckmssqlDMLTP

AP/TPTPAPDBLE

OLTPshardingUser [1.3 user.xml](#)  
 OLAPanalysisUser [1.3 user.xml](#)

DBLESQLSQLDBLESQSLSQL  
 DBLESQLSQLTP/AP

- hybridTAUser

```
mysql> select * from dble_entry a join dble_entry_schema b on a.id = b.id where user_type = 'hybridTAUser'\G
***** 1. row *****
 id: 4
 type: username
 user_type: hybridTAUser
 username: apuser1
password_encrypt: hWj/raQ08POPSUZykAbUnQVvzwI1IdbQw4fbZxmocW71BW6Y0He0Z0nIZfRkXsbQ4KMPegG4D2KkQnwZpbYMpA==
 encrypt_configured: false
 conn_attr_key: NULL
 conn_attr_value: NULL
 white_ips: NULL
 readonly: -
```

```
max_conn_count: no limit
blacklist: NULL
id: 4
schema: aptest
1 row in set (0.01 sec)
```

- apNode

```
mysql> select * from dble_ap_node;
+-----+-----+-----+
| name | db_group | db_schema |
+-----+-----+-----+
| ap1 | dbGroup4 | mysql_db_test2 |
+-----+-----+-----+
2 rows in set (0.00 sec)
```

## 2.39.5

- ClickhouseSQLMySQL
- ClickhouseUNION[Clickhouse UNION Clause](#)MySQLUNIONUNION ALLUNION DISTINCTClickhouse

## 2.40 dble(printkillrecover)

dble

```
mysql> select * from dble_thread_pool;
+-----+-----+-----+-----+-----+
| name | pool_size | core_pool_size | active_count | waiting_task_count |
+-----+-----+-----+-----+-----+
| Timer | 1 | 1 | 0 | 0 |
| TimerScheduler | 2 | 2 | 0 | 15 |
| frontWorker | 8 | 8 | 1 | 0 |
| managerFrontWorker | 4 | 4 | 4 | 0 |
| backendWorker | 8 | 8 | 0 | 0 |
| complexQueryWorker | 8 | 8 | 1 | 0 |
| writeToBackendWorker | 8 | 8 | 8 | 0 |
| NIOFrontRW | 8 | 8 | 8 | 0 |
| NIOBackendRW | 8 | 8 | 8 | 0 |
+-----+-----+-----+-----+-----+
7 rows in set (0.42 sec)

mysql> select * from dble_thread_pool_task;
+-----+-----+-----+-----+-----+-----+
| name | pool_size | active_task_count | task_queue_size | completed_task | total_task |
+-----+-----+-----+-----+-----+-----+
| Timer | 1 | 0 | 0 | 89208 | 89208 |
| TimerScheduler | 2 | 0 | 15 | 1158830 | 1158845 |
| frontWorker | 8 | 0 | 0 | 0 | 0 |
| managerFrontWorker | 4 | 0 | 0 | 60 | 60 |
| backendWorker | 8 | 0 | 0 | 11339 | 11339 |
| complexQueryWorker | 8 | 1 | 0 | 2189 | 2190 |
| writeToBackendWorker | 8 | 0 | 0 | 0 | 0 |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.42 sec)
```

- TimerSchedulerdble
  - (core\_pool\_size)2active\_count0
  - task\_queue\_sizetask\_queue\_size
  - xaid
  - 2hangcompleted\_tasktask\_queue\_size
- Timer TimerScheduler
  - 11(65535);pool\_size1pool\_size2
  - 2hangpool\_sizeactive\_count2completed\_tasktotal\_tasktask\_queue\_size65535
- frontWorker8066
  - active\_countpool\_sizeRUNNING
  - active\_countpool\_sizethread @@recover name='0-frontWorker';
- managerFrontWorker9066
  - frontWorker
- writeToBackendWorkerSQL
  - frontWorker
- NIOFrontRWIO
  - frontWorker
- NIOBackendRWIO
  - frontWorker
- backendWorker
  - active\_count+1pool\_size
- complexQueryWorker
  - active\_count+1pool\_sizecore\_pool\_size
- - thread @@print jstack

### 2.40.1 dblehang

#### 2.40.1.1

TimerTimerScheduler&  
dble"ThreadChecker"2min

1. 10s -- thread.log Thread[{}] suspected hang, execute time:[{}ms] more than 10s, currentState:[{}]
2. active\_task\_countcompleted\_taskthread.log The thread pool where the thread[{}] is located is in the hang state and cannot work. Trigger alarm ,DBLE\_THREAD\_SUSPECTED\_HANG

## 3. 2DBLE\_THREAD\_SUSPECTED\_HANG

**2.40.1.2 print**

```
thread @@print
thread @@print name=?
```

jstackSTWprint

**2.40.2 hangdble**

```
thread @@kill name=?
thread @@kill poolname=? TimerScheduler/Timer
thread @@recover name=?
thread @@recover poolname=? TimerScheduler/Timer
```

&

- TimerScheduler
  - 1hang
  - 1. thread @@kill name=? ;
    2. hang
  - 2hangcompleted\_task
  - 1. thread @@kill poolname=? shutdownSTOPtrue;
    2. pool\_size0shutdown thread @@recover poolname=? pool\_sizecompleted\_tasktotal\_task
    3. pool\_size2
  - thread @@kill name='0-TimerScheduler' + thread @@kill name='1-TimerScheduler' thread @@kill poolname='TimerScheduler'
- Timer
  - TimerScheduler
- frontWorker
  - 1hang
  - 1. thread @@kill name=?
    2. active\_counthang
    3. active\_count thread @@recover name=? , active\_count+1 (name'0-frontWorker"0-frontWorker')
  - killdble
- managerFrontWorker
  - frontWorker
- writeToBackendWorker
  - frontWorker
- NIOFrontRWIO
  - kill/recoverkillNIOFrontRW
- NIOBackendRWIO
  - 1.frontWorker
  - 2.recoverdbleRWfresh conn forced where dbGroup ='groupName' reload @@config\_all -r
  - killdblesqlhangcan't reach kill
- backendWorker
  - 1hang
  - 1. thread @@kill name=?
    2. hang
    3. thread @@recover
- complexQueryWorker
  - backendWorker
- jstack
  - backendWorker thread @@kill name=?

printkillrecoverlogs/therad.log

### 3.

- 3.1 DDL
  - 3.1.1 DDL&Table Syntax
  - 3.1.2 DDL&View Syntax
  - 3.1.3 DDL&Index Syntax
  - 3.1.4 DDL
  - 3.1.5 DDL&Database Syntax
  - 3.1.6 ONLINE DDL
- 3.2 DML
  - 3.2.1 INSERT
  - 3.2.2 REPLACE
  - 3.2.3 DELETE
  - 3.2.4 UPDATE
  - 3.2.5 SELECT
  - 3.2.6 SELECT JOIN syntax
  - 3.2.7 SELECT UNION Syntax
  - 3.2.8 SELECT Subquery Syntax
  - 3.2.9 LOAD DATA
  - 3.2.10 DML
- 3.3 Prepared SQL Syntax
- 3.4 Transactional and Locking Statements
  - 3.4.1
  - 3.4.2
  - 3.4.3 SAVEPOINT
  - 3.4.4 Lock&unlock
  - 3.4.5 SET TRANSACTION Syntax
  - 3.4.6 XA
  - 3.4.7
- 3.5 DAL
  - 3.5.1 SET
  - 3.5.2 SHOW
  - 3.5.3 KILL
  - 3.5.4 DAL
- 3.6
- 3.7 Utility Statements
- 3.8 Hint
- 3.9
- 3.10 (alpha)
- 3.11

## 3.1 DDL

DDL

DDLDMLDDL

- [3.1.1 DDL&Table Syntax](#)
- [3.1.2 DDL&View Syntax](#)
- [3.1.3 DDL&Index Syntax](#)
- [3.1.4 DDL](#)

### 3.1.1 TABLE DDL

#### 3.1.1.1 CREATE TABLE Syntax

```

CREATE TABLE [IF NOT EXISTS] tbl_name
 (create_definition,...)
 [table_options]
 [partition_options]

create_definition:
 col_name column_definition

column_definition:
 data_type [NOT NULL | NULL] [DEFAULT default_value]
 [AUTO_INCREMENT] [UNIQUE [KEY] | [PRIMARY] KEY]
 [COMMENT 'string']

data_type:
 BIT[(length)]
 | TINYINT[(length)] [UNSIGNED] [ZEROFILL]
 | SMALLINT[(length)] [UNSIGNED] [ZEROFILL]
 | MEDIUMINT[(length)] [UNSIGNED] [ZEROFILL]
 | INT[(length)] [UNSIGNED] [ZEROFILL]
 | INTEGER[(length)] [UNSIGNED] [ZEROFILL]
 | BIGINT[(length)] [UNSIGNED] [ZEROFILL]
 | REAL[(length,decimals)] [UNSIGNED] [ZEROFILL]
 | DOUBLE[(length,decimals)] [UNSIGNED] [ZEROFILL]
 | FLOAT[(length,decimals)] [UNSIGNED] [ZEROFILL]
 | DECIMAL[(length[,decimals])] [UNSIGNED] [ZEROFILL]
 | NUMERIC[(length[,decimals])] [UNSIGNED] [ZEROFILL]
 | DATE
 | TIME[(fsp)]
 | TIMESTAMP[(fsp)]
 | DATETIME[(fsp)]
 | YEAR
 | CHAR[(length)]
 | VARCHAR(length)
 | BINARY[(length)]
 | VARBINARY(length)
 | TINYBLOB
 | BLOB
 | MEDIUMBLOB
 | LONGBLOB
 | TINYTEXT
 | TEXT
 | MEDIUMTEXT
 | LONGTEXT
 | ENUM(value1,value2,value3,...)

table_options:
 table_option [,] table_option ...

table_option:
 ENGINE [=] engine_name
 | [DEFAULT] CHARACTER SET [=] charset_name
 | CHECKSUM [=] {0 | 1}
 | [DEFAULT] COLLATE [=] collation_name
 | COMMENT [=] 'string'
 | CONNECTION [=] 'connect_string'
 | KEY_BLOCK_SIZE [=] value
 | MAX_ROWS [=] value
 | MIN_ROWS [=] value
 | PASSWORD [=] 'string'
 | ROW_FORMAT [=] {DEFAULT|DYNAMIC|FIXED|COMPRESSED|REDUNDANT|COMPACT}
 | STATS_AUTO_RECALC [=] {DEFAULT|0|1}
 | STATS_PERSISTENT [=] {DEFAULT|0|1}

partition_options:
 {[LINEAR] HASH(expr)
 | PARTITION BY [linear] KEY (column_list)
 | RANGE{(expr) | COLUMNS(column_list)}
 | LIST{(expr) | COLUMNS(column_list)}
 }
 [(partition_definition [, partition_definition] ...)]

```

- engine\_name“InnoDB”
- CREATE TABLE `test` (`id` enum('1','2','3') DEFAULT '1')id'1'dbleissue <https://github.com/actiontech/dble/issues/816>

```
create table if not exists test(
 id bigint primary key AUTO_INCREMENT,
 col1 int not null default 5,
 col2 int null COMMENT 'info for col1',
 col3 varchar(20) not null,
 col4 varchar(20) unique key
);

create table test(
 id int primary key,
 col_bit BIT(1),
 col_tinyint TINYINT(2) UNSIGNED ZEROFILL,
 col_smallint SMALLINT(3) UNSIGNED ZEROFILL,
 col_mediumint MEDIUMINT(4) UNSIGNED ZEROFILL,
 col_int INT(5) UNSIGNED ZEROFILL,
 col_integer INTEGER(6) UNSIGNED ZEROFILL,
 col_bigint BIGINT(7) UNSIGNED ZEROFILL,
 col_real REAL(8,1) UNSIGNED ZEROFILL,
 col_double DOUBLE(9,2) UNSIGNED ZEROFILL,
 col_float FLOAT(10,3) UNSIGNED ZEROFILL,
 col_decimal DECIMAL(11,4) UNSIGNED ZEROFILL,
 col_numeric NUMERIC(12,5) UNSIGNED ZEROFILL,
 col_date DATE,
 col_time TIME(3),
 col_timestamp TIMESTAMP(4),
 col_datetime DATETIME(5),
 col_year YEAR,
 col_char CHAR(10) ,
 col_varcgar VARCHAR(20) ,
 col_binary BINARY(30),
 col_varbinary VARBINARY(40),
 col_tinyblob TINYBLOB,
 col_blob BLOB,
 col_mediumblob MEDIUMBLOB,
 col_longblob LONGBLOB,
 col_tinytext TINYTEXT ,
 col_text TEXT ,
 col_mediumtext MEDIUMTEXT ,
 col_longtext LONGTEXT ,
 col_enum ENUM('a', 'b', 'c')
);
```

```
create table test(
 id int primary key,
 col1 varchar(20)
)ENGINE = innodb
AVG_ROW_LENGTH = 20
DEFAULT CHARACTER SET = utf8
CHECKSUM = 1
DEFAULT COLLATE = utf8_general_ci
COMMENT = 'info of table test'
CONNECTION = '111111'
DELAY_KEY_WRITE = 1
INSERT_METHOD = LAST
KEY_BLOCK_SIZE = 65536
MAX_ROWS = 3
MIN_ROWS = 2
PACK_KEYS = 1
ROW_FORMAT = DEFAULT;
```

### 3.1.1.2 ALTER TABLE Syntax

```
ALTER [IGNORE] TABLE tbl_name
[alter_specification [, alter_specification] ...]

alter_specification:
| ADD [COLUMN] col_name column_definition
 [FIRST | AFTER col_name]
| ADD [COLUMN] (col_name column_definition, ...)
```

```

| ADD {INDEX | KEY} [index_name]
| CHANGE [COLUMN] old_col_name new_col_name column_definition
 [FIRST|AFTER col_name]
| MODIFY [COLUMN] col_name column_definition
 [FIRST | AFTER col_name]
| DROP [COLUMN] col_name
| DROP {INDEX | KEY} index_name
| ADD [INDEX|KEY] [index_name] (index_col_name,...)
| DROP {INDEX|KEY} index_name
| ADD PRIMARY KEY (index_col_name,...)
| DROP PRIMARY KEY
| ALTER [COLUMN] col_name
 {SET DEFAULT {literal | (expr)} | DROP DEFAULT}
| COMMENT [=] 'string'

```

```

alter table test add column col5 int not null default 1 first,add column col6 int after col4;
alter table test change column col1 col1_new int after col3;
alter table test modify column col1_new varchar(20) after id;
alter table test drop column col6;
alter table test add key idx_col4(col4);
alter table test add index idx_col4(col4);
alter table test drop key idx_col4;
alter table test drop index idx_col4;
alter table test drop primary key;
alter table test add primary key (id);
alter table test alter column col set default 0;
alter table test alter column col drop default;
alter table test comment = 'string';

```

### 3.1.1.3 DROP TABLE Syntax

```

DROP TABLE [IF EXISTS]
 tbl_name [, tbl_name] ...
 [RESTRICT | CASCADE]

```

```

drop table if exists test cascade;
drop table test restrict;

```

### 3.1.1.4 TRUNCATE TABLE Syntax

```

TRUNCATE [TABLE] tbl_name

```

```

truncate table test;

```

### 3.1.2 VIEW DDL

Syntax

**create view :**

```
CREATE [OR REPLACE] VIEW
 view_name [(column_list)]
 AS select_statement
```

**alter view :**

```
alter VIEW
 view_name [(column_list)]
 AS select_statement
```

**drop view:**

```
DROP VIEW [IF EXISTS] view_name [, view_name]
```

**show create view :**

```
SHOW CREATE VIEW view_name;
```

### 3.1.3 INDEX DDL

#### 3.1.3.1 CREATE INDEX Syntax

```
CREATE [UNIQUE|FULLTEXT] INDEX index_name
[index_type]
ON tbl_name (index_col_name, ...)
```

```
index_col_name:
 col_name [(length)] [ASC | DESC]
```

```
index_type:
 USING {BTREE | HASH}
```

```
create unique index idx1 using btree on test(col1);
create index idx2 using hash on test(col2);
create fulltext index idx3 on test(col4);
create fulltext index idx4 on test(col4(10));
```

#### 3.1.3.2 DROP INDEX Syntax

```
DROP INDEX index_name ON tbl_name
```

```
drop index idx1 on test;
```

### 3.1.4 DDL

DDLdblemysqlDDL(eg. ALTER EVENT)  
dblemysqlDDL

```
/*!dble:sql=select ... from tbx where id=M*/ ddl statement
```

tbx idM

```
MySQL [TESTDB]> /*!dble:sql=select * from a_test where id=2*/CREATE PROCEDURE account_count()
BEGIN SELECT 'Number of accounts:', COUNT(*) FROM mysql.user;
END//
```

### 3.1.5 DATABASE DDL

#### 3.1.5.1 CREATE DATABASE Syntax

```
CREATE {DATABASE | SCHEMA} [IF NOT EXISTS] db_name
[create_specification] ...
```

```
create_specification:
[DEFAULT] CHARACTER SET [=] charset_name
| [DEFAULT] COLLATE [=] collation_name
| DEFAULT ENCRYPTION [=] {'Y' | 'N'}
```

- schemashema.xml
- create\_specification
-

### 3.1.6 ONLINE DDL

#### 3.1.6.1

1. 3.20.04.0dbledddbleSQLdddbleshow create table dble
2. SQLdbledbdledbldbnullsqlmysqlonlineDDL

#### 3.1.6.2 ONLINE DDL

MySQL 8.0online ddldbleonline ddl

- Index Operations
- Primary Key Operations
- Column Operations
- Generated Column Operations
- Foreign Key Operations
- Table Operations
- Tablespace Operations
- Partitioning Operations

1			CREATE INDEX <i>name</i> ON <i>table</i> ( <i>col_list</i> );ALTER TABLE <i>tbl_name</i> ADD INDEX <i>name</i> ( <i>col_list</i> );		
2			DROP INDEX <i>name</i> ON <i>table</i> ;ALTER TABLE <i>tbl_name</i> DROP INDEX <i>name</i> ;		
3			ALTER TABLE <i>tbl_name</i> RENAME INDEX <i>old_index_name</i> TO <i>new_index_name</i> , ALGORITHM=INPLAC E, LOCK=NONE;		mysql 5.6 online ddl
4		FULLTEXT	CREATE FULLTEXT INDEX <i>name</i> ON <i>table(column)</i> ;		mysql
5		Spatial	CREATE TABLE <i>geom</i> ( <i>g</i> GEOMETRY NOT NULL); ALTER TABLE <i>geom</i> ADD SPATIAL INDEX( <i>g</i> ), ALGORITHM=INPLAC E, LOCK=SHARED;		mysql
6			ALTER TABLE <i>tbl_name</i> DROP INDEX <i>i1</i> , ADD INDEX <i>i1(key_part,... )</i> USING BTREE, ALGORITHM=INSTAN T;		
7			ALTER TABLE <i>tbl_name</i> ADD PRIMARY KEY ( <i>column</i> ), ALGORITHM=INPLAC E, LOCK=NONE;		
8			ALTER TABLE <i>tbl_name</i> DROP PRIMARY KEY, ALGORITHM=COPY;		COPYdml
9			ALTER TABLE <i>tbl_name</i> DROP PRIMARY KEY, ADD PRIMARY KEY ( <i>column</i> ), ALGORITHM=INPLAC E, LOCK=NONE;		
10			ALTER TABLE <i>tbl_name</i> ADD COLUMN <i>column_name</i> <i>column_definition</i> , ALGORITHM=INSTAN T;		dble

11			<code>tbl_name DROP COLUMN column_name, ALGORITHM=INPLACE, LOCK=NONE;</code>		dble
12			<code>ALTER TABLE tbl CHANGE old_col_name new_col_name data_type, ALGORITHM=INPLACE, LOCK=NONE;</code>		dble
13			<code>ALTER TABLE tbl_name MODIFY COLUMN col_name column_definition FIRST, ALGORITHM=INPLACE, LOCK=NONE;</code>		
14			<code>ALTER TABLE tbl_name CHANGE c1 c1 BIGINT, ALGORITHM=COPY;</code>		dml
15		VARCHAR	<code>ALTER TABLE tbl_name CHANGE COLUMN c1 c1 VARCHAR(255), ALGORITHM=INPLACE, LOCK=NONE;</code>		dble
16			<code>ALTER TABLE tbl ALTER COLUMN col SET DEFAULT literal, ALGORITHM=INSTANT;</code>		
17			<code>ALTER TABLE tbl ALTER COLUMN col DROP DEFAULT, ALGORITHM=INSTANT;</code>		
18			<code>ALTER TABLE table AUTO_INCREMENT=n ext_value, ALGORITHM=INPLACE, LOCK=NONE;</code>		
19		NULL	<code>ALTER TABLE tbl_name MODIFY COLUMN column_name data_type NULL, ALGORITHM=INPLACE, LOCK=NONE;</code>		dble
20		NULL	<code>ALTER TABLE tbl_name MODIFY COLUMN column_name data_type NOT NULL, ALGORITHM=INPLACE, LOCK=NONE;</code>		dble
21		ENUM SET	<code>CREATE TABLE t1 (c1 ENUM('a', 'b', 'c'));</code> <code>ALTER TABLE t1 MODIFY COLUMN c1 ENUM('a', 'b', 'c', 'd'), ALGORITHM=INSTANT;</code>		
22			<code>ALTER TABLE tbl1 ADD CONSTRAINT fk_name FOREIGN KEY index (col1) REFERENCES tbl2(col2) referential_actions;</code>		dble
23			<code>ALTER TABLE tbl DROP FOREIGN KEY fk_name;</code>		
24	Generated	Generated	<code>ALTER TABLE t1 ADD COLUMN (c2 INT GENERATED ALWAYS AS (c1 + 1) STORED), ALGORITHM=COPY;</code>		
			<code>ALTER TABLE t1 MODIFY COLUMN c2</code>		

25		Generated	INT GENERATED ALWAYS AS (c1 + 1) STORED FIRST, ALGORITHM=COPY;		
26		Generated	ALTER TABLE t1 DROP COLUMN c2, ALGORITHM=INPLACE, LOCK=NONE;		
27		VIRTUAL	ALTER TABLE t1 ADD COLUMN (c2 INT GENERATED ALWAYS AS (c1 + 1) VIRTUAL), ALGORITHM=INSTANT;		
28		VIRTUAL	ALTER TABLE t1 MODIFY COLUMN c2 INT GENERATED ALWAYS AS (c1 + 1) VIRTUAL FIRST, ALGORITHM=COPY;		
29		VIRTUAL	ALTER TABLE t1 DROP COLUMN c2, ALGORITHM=INSTANT;		
30					MySQL
31					dble

### 3.1.6.3

1. dble druidonline ddl “ALGORITHM=INPLACE, LOCK=NONE” <https://github.com/alibaba/druid/issues/3750>

## 3.2 DML

### DML

- [3.2.1 INSERT](#)
- [3.2.2 REPLACE](#)
- [3.2.3 DELETE](#)
- [3.2.4 UPDATE](#)
- [3.2.5 SELECT](#)
- [3.2.6 SELECT JOIN syntax](#)
- [3.2.7 SELECT UNION Syntax](#)
- [3.2.8 SELECT Subquery Syntax](#)
- [3.2.9 LOAD DATA](#)
- [3.2.10 DML](#)

### 3.2.1 INSERT

#### 3.2.1.1 Syntax

INSERT2

```

INSERT
 [INTO] tbl_name
 [(col_name [, col_name] ...)]
 { {VALUES | VALUE} (value_list) [, (value_list)] ... }
 [ON DUPLICATE KEY UPDATE assignment_list]

INSERT
 [INTO] tbl_name
 SET assignment_list
 [ON DUPLICATE KEY UPDATE assignment_list]

value:
 {expr | DEFAULT}

value_list:
 value [, value] ...

assignment:
 col_name =
 value

assignment_list:
 assignment [, assignment] ...

```

```

INSERT
 [INTO] tbl_name
 [(col_name [, col_name] ...)]
 { SELECT ...
 | TABLE table_name
 }
 [ON DUPLICATE KEY UPDATE assignment_list]

assignment:
 col_name =
 value

assignment_list:
 assignment [, assignment] ...

```

#### 3.2.1.2 MySQL

```

INSERT
- [LOW_PRIORITY | DELAYED | HIGH_PRIORITY] [IGNORE]
 [INTO] tbl_name
- [PARTITION (partition_name [, partition_name] ...)]
 [(col_name [, col_name] ...)]
 { {VALUES | VALUE} (value_list) [, (value_list)] ... }
- [AS row_alias[(col_alias [, col_alias] ...)]]
 [ON DUPLICATE KEY UPDATE assignment_list]

```

```

INSERT
- [LOW_PRIORITY | DELAYED | HIGH_PRIORITY] [IGNORE]
 [INTO] tbl_name
- [PARTITION (partition_name [, partition_name] ...)]
 SET assignment_list
- [AS row_alias[(col_alias [, col_alias] ...)]]
 [ON DUPLICATE KEY UPDATE assignment_list]

```

```

INSERT
- [LOW_PRIORITY | HIGH_PRIORITY] [IGNORE]
 [INTO] tbl_name
- [PARTITION (partition_name [, partition_name] ...)]
 [(col_name [, col_name] ...)]
 { SELECT ...

```

```

| TABLE table_name
- | VALUES row_constructor_list
}
[ON DUPLICATE KEY UPDATE assignment_list]

value:
{expr | DEFAULT}

value_list:
value [, value] ...

-row_constructor_list:
- ROW(value_list)[, ROW(value_list)][, ...]

assignment:
col_name =
 value
- | [row_alias.]col_name
- | [tbl_name.]col_name
- | [row_alias.]col_alias

assignment_list:
assignment [, assignment] ...

```

### 3.2.1.3

```

insert into test (col1,col3) values(1,'cust1'),(2,'cust2');
insert into test (col1,col3) values(default,'cust3');
insert into test set col1=4,col3='cust4';
insert into test set col1=default,col3='cust5';
insert into test (col1,col3) values(default,cast(now() as char));

```

### 3.2.1.4

- ERROW
- dble
- CREATE TABLE `test` (`id` enum('1','2','3') DEFAULT '1')id'1'dbleissue <https://github.com/actiontech/dble/issues/816>
- insert/replace... select dbleSQL
  - 
  - 
  - select

## 3.2.2 REPLACE

### 3.2.2.1 Syntax

REPLACE2

```

REPLACE
 [INTO] tbl_name
 [(col_name [, col_name] ...)]
 {VALUES | VALUE} (value_list) [, (value_list)] ...

REPLACE
 [INTO] tbl_name
 SET assignment_list

value:
 {expr | DEFAULT}

value_list:
 value [, value] ...

assignment:
 col_name = value

assignment_list:
 assignment [, assignment] ...

```

```

REPLACE
 [INTO] tbl_name
 [(col_name [, col_name] ...)]
 {SELECT ... | TABLE table_name}

```

### 3.2.1.2 MySQL

```

REPLACE
- [LOW_PRIORITY | DELAYED]
 [INTO] tbl_name
- [PARTITION (partition_name [, partition_name] ...)]
 [(col_name [, col_name] ...)]
- {
 {VALUES | VALUE} (value_list) [, (value_list)] ...
- |VALUES row_constructor_list
- }

```

```

REPLACE
- [LOW_PRIORITY | DELAYED]
 [INTO] tbl_name
- [PARTITION (partition_name [, partition_name] ...)]
 SET assignment_list

```

```

REPLACE
- [LOW_PRIORITY | DELAYED]
 [INTO] tbl_name
- [PARTITION (partition_name [, partition_name] ...)]
 [(col_name [, col_name] ...)]
 {SELECT ... | TABLE table_name}

```

```

value:
 {expr | DEFAULT}

```

```

value_list:
 value [, value] ...

```

```

-row_constructor_list:
- ROW(value_list)[, ROW(value_list)][, ...]

```

```

assignment:
 col_name = value

```

```

assignment_list:

```

```
assignment [, assignment] ...
```

### 3.2.2.3

```
REPLACE INTO test VALUES (1, 'Old', '2014-08-20 18:47:00');
REPLACE INTO test set id = 1, type= 'Old',create_date = '2014-08-20 18:47:00';
```

### 3.2.2.4

- replacereplaceIDIDID
- insert/replace... select dbleSQL
  - 
  - 
  - select

### 3.2.3 DELETE

#### 3.2.3.1 Single-Table Syntax

##### 3.2.3.1.1 Syntax

```
DELETE
 FROM tbl_name [[AS] tbl_alias]
 [WHERE where_condition]
```

##### 3.2.3.1.2 MySQL

```
DELETE
- [LOW_PRIORITY] [QUICK] [IGNORE]
 FROM tbl_name [[AS] tbl_alias]
- [PARTITION (partition_name [, partition_name] ...)]
 [WHERE where_condition]
- [ORDER BY ...]
- [LIMIT row_count]
```

##### 3.2.3.1.3

```
delete from test where id>5;
```

##### 3.2.3.1.4

- Delete where\_condition

#### 3.2.3.2 Multiple-Table Syntax

- Join DELETE
- DELETEDELETE
  - update/delete where where
  - update/delete where where “” where

##### 3.2.3.2.1 Syntax

```
DELETE
tbl_name[.*] [, tbl_name[.*]] ...
 FROM table_references
 [WHERE where_condition]

DELETE
 FROM tbl_name[.*] [, tbl_name[.*]] ...
 USING table_references
 [WHERE where_condition]
```

##### 3.2.3.2.2 MySQL

```
DELETE
- [LOW_PRIORITY] [QUICK] [IGNORE]
 tbl_name[.*] [, tbl_name[.*]] ...
 FROM table_references
 [WHERE where_condition]

DELETE
- [LOW_PRIORITY] [QUICK] [IGNORE]
 FROM tbl_name[.*] [, tbl_name[.*]] ...
 USING table_references
 [WHERE where_condition]
```

## 3.2.4 UPDATE

### 3.2.4.1 Single-Table Syntax

#### 3.2.4.1.1 Syntax

```

UPDATE
 table_reference
 SET assignment_list
 [WHERE where_condition]

value:
 {expr | DEFAULT}

assignment:
 col_name = value

assignment_list:
 assignment [, assignment] ...

```

#### 3.2.4.1.2 MySQL

```

UPDATE
- [LOW_PRIORITY] [IGNORE]
 table_reference
 SET assignment_list
 [WHERE where_condition]
- [ORDER BY ...]
- [LIMIT row_count]

value:
 {expr | DEFAULT}

assignment:
 col_name = value

assignment_list:
 assignment [, assignment] ...

```

#### 3.2.4.1.3

```
UPDATE test SET VALUE =1 where id=5;
```

#### 3.2.4.1.4

- UPDATE where\_condition

### 3.2.4.2 Multiple-Table Syntax

- Join UPDATE
- updateUPDATE
  - updatewhere where
  - updateherewhere, “” where
- whereERSQL
- update
  - update
  - 
  - setwhere

#### 3.2.4.2.1 Syntax

```

UPDATE
 table_references
 SET assignment_list
 [WHERE where_condition]

```

#### 3.2.4.2.2 MySQL

```
UPDATE
```

```
- [LOW_PRIORITY] [IGNORE]
 table_references
 SET assignment_list
 [WHERE where_condition]
```

## 3.2.5 SELECT

### 3.2.5.1 Syntax

```

SELECT
 [ALL | DISTINCT | DISTINCTROW]
 select_expr [, select_expr] ...
 [FROM table_references]
 [WHERE where_condition]
 [GROUP BY {col_name | expr }, ...]
 [HAVING where_condition]
 [ORDER BY {col_name | expr }
 [ASC | DESC], ...]
 [LIMIT {[offset,] row_count | row_count OFFSET offset}]
 [FOR {UPDATE | SHARE}
 [NOWAIT | SKIP LOCKED]
 | LOCK IN SHARE MODE]

```

### 3.2.5.2 MySQL

```

SELECT
 [ALL | DISTINCT | DISTINCTROW]
 - [HIGH_PRIORITY]
 - [STRAIGHT_JOIN]
 - [SQL_SMALL_RESULT] [SQL_BIG_RESULT] [SQL_BUFFER_RESULT]
 - [SQL_NO_CACHE] [SQL_CALC_FOUND_ROWS]
 select_expr [, select_expr] ...
 - [into_option]
 [FROM table_references
 - [PARTITION partition_list]
]
 [WHERE where_condition]
 [GROUP BY {col_name | expr
 - | position
 }, ...]
 - [WITH ROLLUP]
]
 [HAVING where_condition]
 - [WINDOW window_name AS (window_spec)
 - [, window_name AS (window_spec)] ...]
 [ORDER BY {col_name | expr
 - | position
 } [ASC | DESC], ...]
 - [WITH ROLLUP]
]
 [LIMIT {[offset,] row_count | row_count OFFSET offset}]
 - [into_option]
 [FOR {UPDATE | SHARE}
 - [OF tbl_name [, tbl_name] ...]
 [NOWAIT | SKIP LOCKED]
 | LOCK IN SHARE MODE]
 - [into_option]

 -_into_option: {
 - INTO OUTFILE 'file_name'
 - [CHARACTER SET charset_name]
 - export_options
 - | INTO DUMPFILE 'file_name'
 - | INTO var_name [, var_name] ...
 -}

```

### 3.2.5.3

```

select id,col1,col3 from test where id=3;
select distinct col1,col3 from test where id>=3;
select count(*),max(id),col1 from test group by col1 desc having(count(*)>1) order by col1 desc;
select id,col1,col3 from test order by id limit 2 offset 2;
select id,col1,col3 from test order by id limit 2,2;
select 1+1,'test',id,col1*1.1,now() from test limit 3;
select current_date,current_timestamp;
select * from test where id=3 for update skip locked;
select * from test where id=3 for share;

```

```
select * from test where id=3 LOCK IN SHARE MODE;
```

### 3.2.6 JOIN Syntax:

`SELECT`   `DELETE`   `UPDATE`   `table_references`   `JOIN`

#### 3.2.6.1 Syntax

```
table_references:
 table_reference [, table_reference] ...

table_reference:
 table_factor
 | joined_table
}

table_factor:
 tbl_name [[AS] alias]
 | table_subquery [AS] alias
 | (table_references)
}

joined_table:
 table_reference {[INNER | CROSS] JOIN | STRAIGHT_JOIN} table_factor [join_specification]
 | table_reference {LEFT|RIGHT} [OUTER] JOIN table_reference join_specification
 | table_reference NATURAL {[INNER | {LEFT|RIGHT} [OUTER]]} JOIN table_factor
}

join_specification:
 ON search_condition
 | USING (join_column_list)
}

join_column_list:
 column_name [, column_name] ...
```

table\_subquery

#### 3.2.6.2 MySQL

```
table_references:
 escaped_table_reference [, escaped_table_reference] ...

escaped_table_reference:
 table_reference
 - | { OJ table_reference }
}

table_reference:
 table_factor
 | joined_table
}

table_factor:
 tbl_name
 - [PARTITION (partition_names)]
 [[AS] alias]
 - [index_hint_list]
 |
 - [LATERAL]
 table_subquery [AS] alias
 - [(col_list)]
 | (table_references)
}

joined_table:
 table_reference {[INNER | CROSS] JOIN | STRAIGHT_JOIN} table_factor [join_specification]
 | table_reference {LEFT|RIGHT} [OUTER] JOIN table_reference join_specification
 | table_reference NATURAL {[INNER | {LEFT|RIGHT} [OUTER]]} JOIN table_factor
}

join_specification:
 ON search_condition
```

```
| USING (join_column_list)
}

join_column_list:
 column_name [, column_name] ...

-index_hint_list:
- index_hint [, index_hint] ...

-index_hint: {
- USE {INDEX|KEY}
- [FOR {JOIN|ORDER BY|GROUP BY}] ([index_list])
- | {IGNORE|FORCE} {INDEX|KEY}
- [FOR {JOIN|ORDER BY|GROUP BY}] (index_list)
-}

-index_list:
- index_name [, index_name] ...
```

**3.2.7 UNION Syntax:**

MySQL

```
query_block UNION [ALL | DISTINCT] query_block
[UNION [ALL | DISTINCT] query_block]
[...]
```

## 3.2.8 Subquery

### 3.2.8.1 The Subquery as Scalar Operand

For example :

```
SELECT (SELECT s2 FROM t1);
SELECT (SELECT s1 FROM t2) FROM t1;
SELECT UPPER((SELECT s1 FROM t1)) FROM t2;
```

### 3.2.8.2 Comparisons Using Subqueries

:

```
non_subquery_operand comparison_operator (subquery)
```

comparison\_operator :

```
= > < >= <= <> != <=>
```

MySQL :

```
non_subquery_operand LIKE (subquery)
```

### 3.2.8.3 Subqueries with ANY, IN, or SOME

Syntax:

```
operand comparison_operator ANY (subquery)
operand IN (subquery)
operand comparison_operator SOME (subquery)
```

comparison\_operator :

```
= > < >= <= <> !=
```

### 3.2.8.4 Subqueries with ALL

Syntax:

```
operand comparison_operator ALL (subquery)
```

### 3.2.8.5 Subqueries with EXISTS or NOT EXISTS

For example:

```
SELECT column1 FROM t1 WHERE EXISTS (SELECT * FROM t2);
```

### 3.2.8.6 Derived Tables (Subqueries in the FROM Clause)

For example:

```
SELECT ... FROM (subquery) [AS] tbl_name ...
```

```
SELECT * FROM JSON_TABLE(arg_list) [AS] tbl_name ...
SELECT ... FROM (subquery) [AS] tbl_name (col_list) ...
```

### 3.2.8.7 Row Subqueries

### 3.2.8.8 Correlated Subqueries

## 3.2.9 LOAD DATA

### 3.2.9.1 Syntax

```

LOAD DATA
[LOCAL]
INFILE 'file_name'
[REPLACE | IGNORE]
INTO TABLE tbl_name
CHARACTER SET 'charset_name'
[{{FIELDS | COLUMNS}
 [TERMINATED BY 'string']
 [[OPTIONALLY] ENCLOSED BY 'char']
 [ESCAPED BY 'char']
}]
[LINES
 [STARTING BY 'string']
 [TERMINATED BY 'string']
]
[IGNORE number {LINES }]
[(col_name_or_user_var
 [, col_name_or_user_var] ...)]
[SET col_name={expr | DEFAULT}
 [, col_name={expr | DEFAULT}] ...]

```

### 3.2.9.2 MySQL

```

LOAD DATA
- [LOW_PRIORITY | CONCURRENT]
[LOCAL]
INFILE 'file_name'
[REPLACE | IGNORE]
INTO TABLE tbl_name
- [PARTITION (partition_name [, partition_name] ...)]
- [CHARACTER SET charset_name]
+ CHARACTER SET 'charset_name'
[{{FIELDS | COLUMNS}
 [TERMINATED BY 'string']
 [[OPTIONALLY] ENCLOSED BY 'char']
 [ESCAPED BY 'char']
}]
[LINES
 [STARTING BY 'string']
 [TERMINATED BY 'string']
]
[IGNORE number {
 LINES
- | ROWS
 }]
[(col_name_or_user_var
 [, col_name_or_user_var] ...)]
[SET col_name={expr | DEFAULT}
 [, col_name={expr | DEFAULT}] ...]

```

### 3.2.9.3

```
load data infile 'data.txt' into table test_table CHARACTER SET 'utf8mb4' FIELDS TERMINATED by ',';
```

### 3.2.9.4

dbleMySQL,maxRowSizeToFile(bootstrap.cnf) load data local infile  
`local_infile` load data.  
#1085

### 3.2.9.5

- BUGdbleCHARACTER SET charset\_name
- dble druid charset\_name CHARACTER SET 'utf8mb4' CHARACTER SET "utf8mb4" CHARACTER SET utf8mb4
- mysqldbeunload data
- ENCLOSED BYBUG
- loaddata65535bootstrap.cnfmaxCharsPerColumn

- load data,,,dble.issue: <https://github.com/actiontech/dble/issues/770>
- load data,druid,,druid,.issue: <https://github.com/actiontech/dble/issues/1248>
- load data: <https://github.com/actiontech/dble/issues/1507>
- load dataissue <https://github.com/actiontech/dble/issues/1761>

### 3.2.10 DML

#### 3.2.10.1 MySQL

[DO Statement](#)  
[EXCEPT Clause](#)  
[HANDLER Statement](#)  
[IMPORT TABLE Statement](#)  
[INTERSECT Clause](#)  
[LOAD XML Statement](#)  
[Parenthesized Query Expressions](#)  
[TABLE Statement](#)  
[VALUES Statement](#)  
[WITH \(Common Table Expressions\)](#)

#### 3.2.10.2

1. [Set Operations with UNION, INTERSECT, and EXCEPT](#)

[dbleUNION](#)

1. [CALL Statement](#)

[3.6\\_procedure\\_support](#)

## 3.3 Prepared Statements

### 3.3.1 PREPARE Statement

MySQL

```
PREPARE stmt_name FROM preparable_stmt
```

```
prepare stmt1 from "select * from a_test where id=?";
```

### 3.3.2 EXECUTE Statement

MySQL

```
EXECUTE stmt_name
[USING @var_name [, @var_name] ...]
```

```
SET @a = 1;
EXECUTE stmt1 USING @a;
```

### 3.3.3 DEALLOCATE PREPARE Statement

MySQL

```
{DEALLOCATE | DROP} PREPARE stmt_name
```

```
DROP PREPARE stmt1;
```

## 3.4 Transactional and Locking Statements

Transactional and Locking Statements

- [3.4.1](#)
- [3.4.2](#)
- [3.4.3 SAVEPOINT](#)
- [3.4.4 Lock&unlock](#)
- [3.4.5 SET TRANSACTION Syntax](#)
- [3.4.6 XA](#)
- [3.4.7](#)

### 3.4.1 START TRANSACTION, COMMIT, and ROLLBACK Statements

#### 3.4.1.1 Syntax

```
START TRANSACTION
BEGIN
SET autocommit = {0 | 1}
```

```
COMMIT
```

```
ROLLBACK
```

#### 3.4.1.2 MySQL

```
START TRANSACTION
- [transaction_characteristic [, transaction_characteristic] ...]

-transaction_characteristic: {
- WITH CONSISTENT SNAPSHOT
- | READ WRITE
- | READ ONLY
-}

BEGIN
-[WORK]

COMMIT
-[WORK] [AND [NO] CHAIN] [[NO] RELEASE]

ROLLBACK
-[WORK] [AND [NO] CHAIN] [[NO] RELEASE]

SET autocommit = {0 | 1}
```

#### 3.4.1.3

- 2PC(xa)commit, XA

## 3.4.2 Implicit commit SQL

### 3.4.2.1

1064,1046.

### 3.4.2.2 sharding

- [3.1.1 DDL&Table Syntax](#)
- [3.1.2 DDL&View Syntax](#)
- [3.1.3 DDL&Index Syntax](#)
- Lock tables...

### 3.4.2.3 rwsplitmysql:

### 3.4.3 SAVEPOINT, ROLLBACK TO SAVEPOINT, and RELEASE SAVEPOINT Syntax

#### 3.4.3.1 Syntax

MySQL

```
SAVEPOINT identifier
ROLLBACK [WORK] TO [SAVEPOINT] identifier
RELEASE SAVEPOINT identifier
```

#### 3.4.2.2 MySQL

#### 3.4.3.2

```
start transaction
set autocommit = 0;

savepoint
savepoint s0;
insert into test value(1);
savepoint s1;
insert into test value(2);
savepoint s2;
insert into test value(3);

rollback to
rollback to s0

release
release savepoint s0
```

#### 3.4.3.3

1. mysql,savepoint,savepoint.dblesavepoint,.
2. ROLLBACK TO [SAVEPOINT] *identifier* work .

### 3.4.4 Lock&unlock

#### 3.4.4.1 Syntax

```
LOCK TABLES
tbl_name [[AS] alias] lock_type

lock_type: {
 READ | WRITE
}

UNLOCK TABLES
```

#### 3.4.4.2 MySQL

```
LOCK TABLES
tbl_name [[AS] alias] lock_type
- [, tbl_name [[AS] alias] lock_type] ...

lock_type: {
 READ
- [LOCAL]
|
- [LOW_PRIORITY]
 WRITE
}

UNLOCK TABLES
```

#### 3.4.4.3

```
lock tables test_table read;
unlock tables;
```

#### 3.4.4.4

1. session
- 2.

### 3.4.5 SET TRANSACTION Syntax

#### 3.4.5.1 Syntax

```
SET SESSION TRANSACTION ISOLATION LEVEL level
```

```
level: {
 REPEATABLE READ
 | READ COMMITTED
 | READ UNCOMMITTED
 | SERIALIZABLE
}
```

```
SET @@SESSION.TX_ISOLATION = 'level_str'

level_str:
 REPEATABLE-READ
 | READ-COMMITTED
 | READ-UNCOMMITTED
 | SERIALIZABLE
```

#### 3.4.5.2 MySQL

```
SET
- [GLOBAL | SESSION
-]
TRANSACTION
transaction_characteristic
- [, transaction_characteristic] ...
```

```
transaction_characteristic: {
 ISOLATION LEVEL level
- | access_mode
}
```

```
level: {
 REPEATABLE READ
 | READ COMMITTED
 | READ UNCOMMITTED
 | SERIALIZABLE
}
```

```
-access_mode: {
 READ WRITE
- | READ ONLY
- }
```

session

### 3.4.6 XA

dbleXAxa

#### 3.4.6.1 Syntax

XA

```
set xa = {0|1}
```

```
START TRANSACTION;
```

```
BEGIN
```

```
SET autocommit = {0 | 1}
```

```
COMMIT
```

```
ROLLBACK
```

#### 3.4.6.2

- xasql

**3.4.7**

LOCK INSTANCE FOR BACKUP and UNLOCK INSTANCE Statements

### 3.5 DAL

DAL

- [3.5.1 SET](#)
- [3.5.2 SHOW](#)
- [3.5.3 KILL](#)
- [3.5.4 DAL](#)

### 3.5.1 SET

#### 3.5.1.1 XA

```
set xa=value

value:
 0
 | off
 | false
 | 1
 | on
 | true
```

```
set xa=1
```

XA

#### 3.5.1.2 AUTOCOMMIT

```
set autocommit=value

value:
 0
 | off
 | false
 | 1
 | on
 | true
```

```
set autocommit=1
```

AUTOCOMMIT

#### 3.5.1.3 NAMES

```
SET NAMES {'charset_name' [COLLATE 'collation_name'] | DEFAULT}
```

```
set names utf8;
set names utf8 collate utf8_general_ci;
set names default;
```

#### 3.5.1.4 CHARSET

```
SET {CHARACTER SET | CHARSET}
{'charset_name' | DEFAULT}
```

```
set CHARACTER SET utf8;
```

#### 3.5.1.5 COLLATION\_CONNECTION/CHARSET\_SET\_X

```
SET COLLATION_CONNECTION='collation_name'
SET CHARSET_SET_CLIENT='charset_name'
SET CHARSET_SET_RESULTS='charset_name' 'charset_name' NULL
SET CHARSET_SET_CONNECTION='charset_name'
```

```
set collation_connection=utf8_general_ci;
set CHARSET_SET_CLIENT=utf8
set CHARSET_SET_RESULTS=utf8;
set CHARSET_SET_CONNECTION=utf8;
```

**3.5.1.6 TRANSACTION ACCESS MODE**

SET SESSION { TX\_READ\_ONLY | TRANSACTION\_READ\_ONLY}=value

value:

- | 0
- | off
- | false
- | 1
- | on
- | true

```
set session @@tx_read_only=1;
```

MySQLable

**3.5.1.7 TRANSACTION ISOLATION LEVEL**

SET SESSION {TRANSACTION\_ISOLATION | TX\_ISOLATION}=level

level:

READ-UNCOMMITTED | READ-COMMITTED | REPEATABLE-READ | SERIALIZABLE

```
SET SESSION TX_ISOLATION=READ-COMMITTED;
```

**3.5.1.8 USER/SYSTEM VARIABLE**

SET variable\_assignment[, variable\_assignment ] ...

variable\_assignment:

```
@user_var_name = expr
| SESSION system_var_name = expr
| system_var_name = expr
| @@system_var_name = expr
| @@session.system_var_name = expr
```

1.

2.

```
audit_log_current_session
audit_log_filter_id
auto_increment_increment
auto_increment_offset
autocommit
big_tables
binlog_direct_non_transactional_updates
binlog_error_action
binlog_format
binlog_row_image
```

```
binlog_rows_query_log_events
binlogging_impossible_mode
block_encryption_mode
bulk_insert_buffer_size
character_set_client
character_set_connection
character_set_database
character_set_filesystem
character_set_results
character_set_server
collation_connection
collation_database
collation_server
completion_type
debug
debug_sync
default_storage_engine
default_tmp_storage_engine
default_week_format
disconnect_on_expired_password
div_precision_increment
end_markers_in_json
eq_range_index_dive_limit
error_count
explicit_defaults_for_timestamp
external_user
foreign_key_checks
group_concat_max_len
gtid_next
gtid_owned
identity
innodb_create_intrinsic
innodb_ft_user_stopword_table
innodb_lock_wait_timeout
innodb_optimize_point_storage
innodb_strict_mode
innodb_support_xa
innodb_table_locks
innodb_tmpdir
insert_id
interactive_timeout
join_buffer_size
keep_files_on_create
last_insert_id
lc_messages
lc_time_names
lock_wait_timeout
long_query_time
low_priority_updates
max_allowed_packet
max_delayed_threads
max_error_count
max_execution_time
max_heap_table_size
max_insert_delayed_threads
max_join_size
max_length_for_sort_data
max_seeks_for_key
max_sort_length
max_sp_recursion_depth
max_statement_time
max_user_connections
min_examined_row_limit
myisam_repair_threads
myisam_sort_buffer_size
myisam_stats_method
ndb-allow-copying-alter-table
ndb_autoincrement_prefetch_sz
ndb-blob-read-batch-bytes
ndb-blob-write-batch-bytes
ndb_deferred_constraints
ndb_force_send
ndb_fully_replicated
ndb_index_stat_enable
ndb_index_stat_option
ndb_join_pushdown
ndb_log_bin
ndb_log_bin
```

```
ndb_table_no_logging
ndb_table_temporary
ndb_use_copying_alter_table
ndb_use_exact_count
ndb_use_transactions
ndbinfo_max_bytes
ndbinfo_max_rows
ndbinfo_show_hidden
ndbinfo_table_prefix
net_buffer_length
net_read_timeout
net_retry_count
net_write_timeout
new
old_alter_table
old_passwords
optimizer_prune_level
optimizer_search_depth
optimizer_switch
optimizer_trace
optimizer_trace_features
optimizer_trace_limit
optimizer_trace_max_mem_size
optimizer_trace_offset
parser_max_mem_size
preload_buffer_size
profiling
profiling_history_size
proxy_user
pseudo_slave_mode
pseudo_thread_id
query_alloc_block_size
query_cache_type
query_cache_wlock_invalidate
query_prealloc_size
rand_seed1
rand_seed2
range_alloc_block_size
range_optimizer_max_mem_size
rbr_exec_mode
read_buffer_size
read_rnd_buffer_size
session_track_gtids
session_track_schema
session_track_state_change
session_track_system_variables
show_old_temporals
sort_buffer_size
sql_auto_is_null
sql_big_selects
sql_buffer_result
sql_log_bin
sql_log_off
sql_mode
sql_notes
sql_quote_show_create
sql_safe_updates
sql_select_limit
sql_warnings
storage_engine
thread_pool_high_priority_connection
thread_pool_prio_kickup_timer
time_zone
timestamp
tmp_table_size
transaction_alloc_block_size
transaction_allow_batching
transaction_prealloc_size
transaction_write_set_extraction
tx_isolation
tx_read_only
unique_checks
updatable_views_with_limit
version_tokens_session
version_tokens_session_number
wait_timeout
warning_count
```

```
set @a=20

SET SESSION sql_mode = 'TRADITIONAL';

SET sql_mode = 'TRADITIONAL';
```

1. insert\_id sql\_auto\_is\_null insert\_id issue <https://github.com/actiontech/dble/issues/1252>.

### 3.5.1.9 TRACE

```
SQL, show trace
select @@trace SQLtrace
```

```
set trace=value
```

```
value:
 0
 | off
 | false
 | 1
 | on
 | true
```

```
set trace=1
```

## 3.5.2 SHOW

### 3.5.2.1 dbleSHOW

- SHOW DATABASES  
sharding.xml schema
- SHOW CREATE DATABASE [IF NOT EXISTS] schema  
sharding.xml schemadb
- SHOW [FULL|ALL] TABLES [FROM db\_name] [LIKE 'pattern'] WHERE expr  
schmeaschematables  
schemaschematables
- SHOW ALL TABLES [FROM db\_name] [LIKE 'pattern'] WHERE expr  
dbleSHOW FULL TABLES Table\_type SHARDING TABLEsharding table GLOBAL TABLE [6.Differenrece\\_from\\_MySQL\\_Server.md](#)
- SHOW [FULL] {COLUMNS | FIELDS} FROM tbl\_name [{FROM|IN} db\_name] [LIKE 'pattern' | WHERE expr]  
schemaschema
- SHOW { INDEX | INDEXES | KEYS } {FROM | IN} tbl\_name [ {FROM | IN} db\_name ] [ WHERE expr]  
schemaschema
- SHOW CREATE TABLE tbl\_name  
schemaschema
- SHOW [GLOBAL | SESSION] VARIABLES [LIKE 'pattern' | WHERE expr]  
global
- SHOW CREATE VIEW view\_name  
dbview
- SHOW CHARSET  
show character set
- SHOW TABLE STATUS [{FROM | IN} db\_name] [LIKE 'pattern' | WHERE expr]  
SQLyognameshow tables
- SHOW TRACE  
trace [SQLtrace](#)

explain

```
show databases
show full tables
show columns from a_test;
show index from a_test;
show create table a_test;
show variables;
show charset;
```

### 3.5.2.2 dbleSHOW

dbleSHOWSHOWMySQL

```
SHOW CHARACTER SET;
SHOW CHARACTER SET like 'utf8';
SHOW CHARACTER SET where maxlen=2;
```

### 3.5.3 KILL

MySQL

```
KILL [CONNECTION | QUERY] processlist_id
```

#### 3.5.3.1 KILL [CONNECTION] conn\_id

conn\_id idshow @@connection

##### 3.5.3.1.1

```
kill 1;
```

##### 3.5.3.1.2

- KillOK
- KillXA
- MYSQL KILL processlist\_id

#### 3.5.3.2 KILL query conn\_id

conn\_id idshow @@connection

##### 3.5.3.2.1

```
kill query 1;
```

##### 3.5.3.2.3

- dble kill query
- mysql

##### 3.5.3.2.2

- ddl
- dml

### 3.5.4 DAL

#### 3.5.4.1 MySQL

[Account Management Statements](#)  
[Resource Group Management Statements](#)  
[Table Maintenance Statements](#)  
[Component, Plugin, and Loadable Function Statements](#)  
[CLONE Statement](#)  
[BINLOG Statement](#)  
[CACHE INDEX Statement](#)  
[FLUSH Statement](#)  
[LOAD INDEX INTO CACHE Statement](#)  
[RESET Statement](#)  
[RESET PERSIST Statement](#)  
[RESTART Statement](#)  
[SHUTDOWN Statement](#)

## 3.6

### 3.6.1 Syntax

#### Create procedure

```
/Hint/
CREATE
[DEFINER = user]
PROCEDURE [IF NOT EXISTS] sp_name ([proc_parameter[,...]])
[characteristic ...] routine_body

/Hint/
CREATE
[DEFINER = user]
FUNCTION [IF NOT EXISTS] sp_name ([func_parameter[,...]])
RETURNS type
[characteristic ...] routine_body

proc_parameter:
[IN | OUT | INOUT] param_name type

func_parameter:
param_name type

type:
Any valid MySQL data type

characteristic: {
COMMENT 'string'
| LANGUAGE SQL
| [NOT] DETERMINISTIC
| { CONTAINS SQL | NO SQL | READS SQL DATA | MODIFIES SQL DATA }
| SQL SECURITY { DEFINER | INVOKER }
}

routine_body:
Valid SQL routine statement
```

MySQL,hint

```
+ /Hint/
CREATE
[DEFINER = user]
PROCEDURE [IF NOT EXISTS] sp_name ([proc_parameter[,...]])
[characteristic ...] routine_body

+ /Hint/
CREATE
[DEFINER = user]
FUNCTION [IF NOT EXISTS] sp_name ([func_parameter[,...]])
RETURNS type
[characteristic ...] routine_body

proc_parameter:
[IN | OUT | INOUT] param_name type

func_parameter:
param_name type

type:
Any valid MySQL data type

characteristic: {
COMMENT 'string'
| LANGUAGE SQL
| [NOT] DETERMINISTIC
| { CONTAINS SQL | NO SQL | READS SQL DATA | MODIFIES SQL DATA }
| SQL SECURITY { DEFINER | INVOKER }
}

routine_body:
Valid SQL routine statement
```

## drop procedure

```
/Hint/ DROP {PROCEDURE | FUNCTION} [IF EXISTS] sp_name
```

MySQL,hint

```
+ /Hint/
DROP {PROCEDURE | FUNCTION} [IF EXISTS] sp_name
```

## call procedure

```
[/Hint/] CALL sp_name([parameter[,...]])
```

```
[/Hint/] CALL sp_name[()]
```

MySQL,hint

```
+ [/Hint/]
CALL sp_name([parameter[,...]])
```

```
+ [/Hint/]
CALL sp_name[()]
```

## 3.6.2

```
/*!dbe:sql=select 1 from account */drop procedure if exists proc_arc;
```

```
/*!dbe:sql=select 1 from account */create procedure proc_arc(userid1 int)
begin
 insert into account_arc select * from account where userid=userid1;
 update account set arc_flag=true,arc_time=now() where userid=userid1;
end;
```

```
/*!dbe:sql=select 1 from account */call proc_arc(1);
```

## 3.6.3

- dbleMySQLMySQL
- 
- dble

## 3.7 Utility Statements

### 3.7.1 USE Statement

MySQL

```
USE db_name
```

```
use TESTDB;
```

### 3.7.2 EXPLAIN Statement

EXPLAIN dble [2.17\\_explain](#)

```
EXPLAIN explainable_stmt

explainable_stmt: {
 SELECT statement
 | DELETE statement
 | INSERT statement
 | REPLACE statement
 | UPDATE statement
}
```

MySQL

```
-{EXPLAIN | DESCRIBE | DESC}
- tbl_name [col_name | wild]

-{
EXPLAIN
- | DESCRIBE | DESC}
- [explain_type]
- {
explainable_stmt
- | FOR CONNECTION connection_id}

-{EXPLAIN | DESCRIBE | DESC} ANALYZE [FORMAT = TREE] select_statement

-explain_type: {
- FORMAT = format_name
-}

-format_name: {
- TRADITIONAL
- | JSON
- | TREE
-}

explainable_stmt: {
 SELECT statement
 | TABLE statement
 | DELETE statement
 | INSERT statement
 | REPLACE statement
 | UPDATE statement
}
```

```
explain SELECT select * from a_test where id=1;
```

1. INSERT
2. dbleEXPLAIN DESC

### 3.7.3 DESC

DESCdble

```
{DESCRIBE | DESC} tbl_name [col_name | wild]
```

MySQL

```
{EXPLAIN | DESCRIBE | DESC}
tbl_name [col_name | wild]

-{
-EXPLAIN
- | DESCRIBE | DESC}
- [explain_type]
- {
- explainable_stmt
- | FOR CONNECTION connection_id}

-{EXPLAIN | DESCRIBE | DESC} ANALYZE [FORMAT = TREE] select_statement

-explain_type: {
- FORMAT = format_name
-}

-format_name: {
- TRADITIONAL
- | JSON
- | TREE
-}

-explainable_stmt: {
- SELECT statement
- | TABLE statement
- | DELETE statement
- | INSERT statement
- | REPLACE statement
- | UPDATE statement
-}
```

```
DESC a_test id;
```

: dbleEXPLAIN DESC

### 3.7.4 EXPLAIN2

[22.17\\_explain](#)

```
EXPLAIN2 shardingNode=node_name sql=sql_stmt
```

```
explain2 shardingNode=dn2 sql=select * from a_test where id=1;
```

### 3.7.5 HELP Statement

## 3.8 Hint

### 3.8.1 -Syntax

```
/* { ! | #}dble: {sql=SELECT select_expr FROM table_references WHERE where_condition
|shardingNode=shardingNode_name
|db_type={slave|master}}
*/
ordinary_sql
```

### 3.8.2 -Syntax

```
/* { ! | #}dble: {db_type={slave|master}}
|db_instance_url={ip:port}
*/
ordinary_sql
/* master */ ordinary_sql
/* uproxy_dest: ip:port */ ordinary_sql
```

- sql /\* master \*/ /\* uproxy\_dest: ip:port \*/ sql

### 3.8.3

```
/*!dble:sql=select 1 from sbtest */ call p_show_time();
/*!dble:shardingNode=dn1*/ update sbtest set name = 'test';
/*!dble:db_type=master*/ select count(*) from sbtest;
/*!dble:db_instance_url=127.0.0.1:3307*/ select count(*) from sbtest;
/*#dble:sql=select 1 from sbtest */ call p_show_time();
/*#dble:shardingNode=dn1*/ update sbtest set name = 'test';
/*#dble:db_type=master*/ select count(*) from sbtest;
/*#dble:db_instance_url=127.0.0.1:3307*/ select count(*) from sbtest;
select /* master */ * from sbtest;
show processlist /* uproxy_dest: 127.0.0.1:3307 */
```

## 3.9

- Compound-Statement Syntax
- Replication Statements
- DDL
  - databasealter databasedrop databasecreate database schemaok
  - databasealter database
  - createtableoptionDATADIRECTORYALGORITHMtable optionalter table
  - ALTER TABLE ... LOCK ...
  - ALTER TABLE ... ORDER BY ...
  - create table ... select ...
  - 
  - 
  - 
  - 
  -
- DML
  - INSERT... VALUES(expr)expr
  - INSERT... SELECT...

```

<shardingTable name="test10" shardingNode="dn2,dn3,dn4" function="hash-three" shardingColumn="id"/>
<shardingTable name="test11" shardingNode="dn2,dn3,dn4" function="hash-three" shardingColumn="id"/>
<shardingTable name="test12" shardingNode="dn3,dn4" function="hash-two" shardingColumn="id"/>
<singleTable name="test20" shardingNode="dn2" />
<singleTable name="test22" shardingNode="dn1" />
<globalTable name="test30" shardingNode="dn1,dn2,dn3,dn4" />
<globalTable name="test31" shardingNode="dn1,dn2,dn3,dn4" />

```

- insert into test10(id,name) select id,name from test11; insert into test30(id,name) select id,name from test31;
- insert into test30(id,score) select id,score from test10;
- insert into test20(id,score) select id,score from test22;insert into test10(id,score) select id,score from test12;
- INSERT
- HANDLER
- 
- DELETE ... ORDER BY ... LIMIT ...
- DELETE/UPDATE ...LIMIT
- DO
- - select ... use/ignore index ...
  - select ... group by ... with rollup
  - select ... for update | lock in share mode
  - select ... into outfile ...
  - Row Subqueries
  - select ... union [all] select ... order by ... (select ...) union [all] (select ...) order by ...
  - sessionset @rowid=0;select @rowid:="@rowid+1,id from user;
- - 
  - ANALYZE/CHECK/CHECKSUM/OPTIMIZE/REPAIR TABLE
  - INSTALL/UNINSTALL PLUGIN
  - BINLOG
  - CACHE INDEX/ LOAD INDEX INTO CACHE
  - FLUSH TABLES [WITH READ LOCK]FLUSHFLUSH TABLE
  - RESET
  - SHOWSHOW PROFILESSHOW ERRORS

## 3.10 (alpha)

### 3.10.0

1. SQLMySQL.
2. 2.18.09.0 bug
- 3.
- 4.

#### 3.10.1 Operators

Name	Description	Support
AND, &&	Logical AND	Y
=	Assign a value (as part of a SET statement, or as part of the SET clause in an UPDATE statement)	Y
:=	Assign a value	N
BETWEEN ... AND ...	Check whether a value is within a range of values	Y
BINARY	Cast a string to a binary string	N
&	Bitwise AND	Y
~	Bitwise inversion	Y
	Bitwise OR	Y
^	Bitwise XOR	Y
CASE	Case operator	Y
DIV	Integer division	Y
/	Division operator	Y
=	Equal operator	Y
<=>	NULL-safe equal to operator	Y
>	Greater than operator	Y
>=	Greater than or equal operator	Y
IS	Test a value against a boolean	Y
IS NOT	Test a value against a boolean	Y
IS NOT NULL	NOT NULL value test	Y
IS NULL	NULL value test	Y
->	Return value from JSON column after evaluating path; equivalent to JSON_EXTRACT().	N
->>	Return value from JSON column after evaluating path and unquoting the result; equivalent to JSON_UNQUOTE(JSON_EXTRACT()).	N
<<	Left shift	Y
<	Less than operator	Y
<=	Less than or equal operator	Y
LIKE	Simple pattern matching	Y
-	Minus operator	Y
%, MOD	Modulo operator	Y
NOT, !	Negates value	Y
NOT BETWEEN ... AND ...	Check whether a value is not within a range of values	Y
!=, <>	Not equal operator	Y
NOT LIKE	Negation of simple pattern matching	Y
NOT REGEXP	Negation of REGEXP	Y
, OR	Logical OR	Y
+	Addition operator	Y
REGEXP	Whether string matches regular expression	Y
>>	Right shift	Y
RLIKE	Whether string matches regular expression	N
SOUNDS LIKE	Compare sounds	N

*	Multiplication operator	N
-	Change the sign of the argument	Y
XOR	Logical XOR	Y
COALESCE()	Return the first non-NULL argument	Y
GREATEST()	Return the largest argument	Y
IN()	Check whether a value is within a set of values	Y
INTERVAL()	Return the index of the argument that is less than the first argument	Y
ISNULL()	Test whether the argument is NULL	Y
LEAST()	Return the smallest argument	Y
STRCMP()	Compare two strings	Y

### 3.10.2 Control Flow Functions

Name	Description	Support
CASE	Case operator	Y
IF()	If/else construct	Y
IFNULL()	Null if/else construct	Y
NULLIF()	Return NULL if expr1 = expr2	Y

### 3.10.3 String Functions

Name	Description	Support
ASCII()	Return numeric value of left-most character	Y
BIN()	Return a string containing binary representation of a number	N
BIT_LENGTH()	Return length of argument in bits	Y
CHAR()	Return the character for each integer passed	Y
CHAR_LENGTH()	Return number of characters in argument	Y
CHARACTER_LENGTH()	Synonym for CHAR_LENGTH()	Y
CONCAT()	Return concatenated string	Y
CONCAT_WS()	Return concatenate with separator	Y
ELT()	Return string at index number	Y
EXPORT_SET()	Return a string such that for every bit set in the value bits, you get an on string and for every unset bit, you get an off string	N
FIELD()	Return the index (position) of the first argument in the subsequent arguments	Y
FIND_IN_SET()	Return the index position of the first argument within the second argument	Y
FORMAT()	Return a number formatted to specified number of decimal places	Y
FROM_BASE64()	Decode base64 encoded string and return result	N
HEX()	Return a hexadecimal representation of a decimal or string value	Y
INSERT()	Insert a substring at the specified position up to the specified number of characters	Y
INSTR()	Return the index of the first occurrence of substring	Y
LCASE()	Synonym for LOWER()	Y
LEFT()	Return the leftmost number of characters as specified	Y
LENGTH()	Return the length of a string in bytes	Y
LIKE	Simple pattern matching	Y
LOAD_FILE()	Load the named file	N
LOCATE()	Return the position of the first occurrence of substring	Y
LOWER()	Return the argument in lowercase	Y
LPAD()	Return the string argument, left-padded with the specified string	Y

LTRIM()	Remove leading spaces	Y
MAKE_SET()	Return a set of comma-separated strings that have the corresponding bit in bits set	Y
MATCH	Perform full-text search	N
MID()	Return a substring starting from the specified position	N
NOT LIKE	Negation of simple pattern matching	Y
NOT REGEXP	Negation of REGEXP	Y
OCT()	Return a string containing octal representation of a number	N
OCTET_LENGTH()	Synonym for LENGTH()	N
ORD()	Return character code for leftmost character of the argument	Y
POSITION()	Synonym for LOCATE()	N
QUOTE()	Escape the argument for use in an SQL statement	Y
REGEXP	Whether string matches regular expression	Y
REPEAT()	Repeat a string the specified number of times	Y
REPLACE()	Replace occurrences of a specified string	Y
REVERSE()	Reverse the characters in a string	Y
RIGHT()	Return the specified rightmost number of characters	Y
RLIKE	Whether string matches regular expression	N
RPAD()	Append string the specified number of times	Y
RTRIM()	Remove trailing spaces	Y
SOUNDEX()	Return a soundex string	Y
SOUNDS LIKE	Compare sounds	Y
SPACE()	Return a string of the specified number of spaces	Y
STRCMP()	Compare two strings	Y
SUBSTR()	Return the substring as specified	Y
SUBSTRING()	Return the substring as specified	Y
SUBSTRING_INDEX()	Return a substring from a string before the specified number of occurrences of the delimiter	Y
TO_BASE64()	Return the argument converted to a base-64 string	N
TRIM()	Remove leading and trailing spaces	Y
UCASE()	Synonym for UPPER()	Y
UNHEX()	Return a string containing hex representation of a number	Y
UPPER()	Convert to uppercase	Y
WEIGHT_STRING()	Return the weight string for a string	N

### 3.10.3.1 HEX

MySQL HEX <=64string >64MySQL 8.0 MySQL 5.7 dble HEX MySQL 8

### 3.10.4 Numeric Functions and Operators

Name	Description	Support
ABS()	Return the absolute value	Y
ACOS()	Return the arc cosine	Y
ASIN()	Return the arc sine	Y
ATAN()	Return the arc tangent	Y
ATAN2(), ATAN()	Return the arc tangent of the two arguments	Y
CEIL()	Return the smallest integer value not less than the argument	Y
CEILING()	Return the smallest integer value not less than the argument	Y
CONV()	Convert numbers between different number bases	Y
COS()	Return the cosine	Y
COT()	Return the cotangent	Y

CRC32()	Compute a cyclic redundancy check value	Y
DEGREES()	Convert radians to degrees	Y
DIV	Integer division	Y
/	Division operator	Y
EXP()	Raise to the power of	Y
FLOOR()	Return the largest integer value not greater than the argument	Y
LN()	Return the natural logarithm of the argument	Y
LOG()	Return the natural logarithm of the first argument	Y
LOG10()	Return the base-10 logarithm of the argument	Y
LOG2()	Return the base-2 logarithm of the argument	Y
-	Minus operator	Y
MOD()	Return the remainder	N (If the SQL pass through, still supported)
%, MOD	Modulo operator	Y
PI()	Return the value of pi	Y
+	Addition operator	Y
POW()	Return the argument raised to the specified power	Y
POWER()	Return the argument raised to the specified power	Y
RADIANS()	Return argument converted to radians	Y
RAND()	Return a random floating-point value	Y
ROUND()	Round the argument	Y
SIGN()	Return the sign of the argument	Y
SIN()	Return the sine of the argument	Y
SQRT()	Return the square root of the argument	Y
TAN()	Return the tangent of the argument	Y
*	Multiplication operator	Y
TRUNCATE()	Truncate to specified number of decimal places	Y
-	Change the sign of the argument	Y

### 3.10.5 Date and Time Functions

Name	Description	Support
ADDDATE()	Add time values (intervals) to a date value	Y
ADDTIME()	Add time	Y
CONVERT_TZ()	Convert from one time zone to another	N
CURDATE()	Return the current date	Y
CURRENT_DATE()	Synonyms for CURDATE()	Y
CURRENT_TIME()	Synonyms for CURTIME()	Y
CURRENT_TIMESTAMP()	Synonyms for NOW()	Y
CURTIME()	Return the current time	Y
DATE()	Extract the date part of a date or datetime expression	Y
DATE_ADD()	Add time values (intervals) to a date value	Y
DATE_FORMAT()	Format date as specified	Y
DATE_SUB()	Subtract a time value (interval) from a date	Y
DATEDIFF()	Subtract two dates	Y
DAY()	Synonym for DAYOFMONTH()	N
DAYNAME()	Return the name of the weekday	Y
DAYOFMONTH()	Return the day of the month (0-31)	Y
DAYOFWEEK()	Return the weekday index of the argument	Y
DAYOFYEAR()	Return the day of the year (1-366)	Y
EXTRACT()	Extract part of a date	Y
FROM_DAYS()	Convert a day number to a date	Y
FROM_UNIXTIME()	Format Unix timestamp as a date	Y

GET_FORMAT()	Return a date format string	Y
HOUR()	Extract the hour	Y
LAST_DAY	Return the last day of the month for the argument	N
LOCALTIME()	Synonym for NOW()	Y
LOCALTIMESTAMP()	Synonym for NOW()	Y
MAKEDATE()	Create a date from the year and day of year	Y
MAKETIME()	Create time from hour, minute, second	Y
MICROSECOND()	Return the microseconds from argument	Y
MINUTE()	Return the minute from the argument	Y
MONTH()	Return the month from the date passed	Y
MONTHNAME()	Return the name of the month	Y
NOW()	Return the current date and time	Y
PERIOD_ADD()	Add a period to a year-month	Y
PERIOD_DIFF()	Return the number of months between periods	Y
QUARTER()	Return the quarter from a date argument	Y
SEC_TO_TIME()	Converts seconds to 'HH:MM:SS' format	Y
SECOND()	Return the second (0-59)	Y
STR_TO_DATE()	Convert a string to a date	Y
SUBDATE()	Synonym for DATE_SUB() when invoked with three arguments	Y
SUBTIME()	Subtract times	Y
SYSDATE()	Return the time at which the function executes	Y
TIME()	Extract the time portion of the expression passed	Y
TIME_FORMAT()	Format as time	Y
TIME_TO_SEC()	Return the argument converted to seconds	Y
TIMEDIFF()	Subtract time	Y
TIMESTAMP()	With a single argument, this function returns the date or datetime expression; with two arguments, the sum of the arguments	N
TIMESTAMPADD()	Add an interval to a datetime expression	Y
TIMESTAMPDIFF()	Subtract an interval from a datetime expression	Y
TO_DAYS()	Return the date argument converted to days	Y
TO_SECONDS()	Return the date or datetime argument converted to seconds since Year 0	Y
UNIX_TIMESTAMP()	Return a Unix timestamp	Y
UTC_DATE()	Return the current UTC date	Y
UTC_TIME()	Return the current UTC time	Y
UTC_TIMESTAMP()	Return the current UTC date and time	Y
WEEK()	Return the week number	Y
WEEKDAY()	Return the weekday index	Y
WEEKOFYEAR()	Return the calendar week of the date (1-53)	Y
YEAR()	Return the year	Y
YEARWEEK()	Return the year and week	Y
CURRENT_DATE	Synonyms for CURDATE()	N
CURRENT_TIME	Synonyms for CURTIME()	N
CURRENT_TIMESTAMP	Synonyms for NOW()	N
LOCALTIME	Synonym for NOW()	N
LOCALTIMESTAMP()	Synonym for NOW()	N

### 3.10.6 Cast Functions and Operators

Name	Description	Support
BINARY	Cast a string to a binary string	N
CAST()	Cast a value as a certain type	Y

CONVERT()	Cast a value as a certain type	Y
-----------	--------------------------------	---

### 3.10.6.1 CAST

BINARY  
 CHAR[(N)] [charset\_info] charset\_info  
 JSON  
 SIGNED [INTEGER] INTEGER(druid)  
 UNSIGNED [INTEGER] INTEGER (druid)

### 3.10.6.2 CONVERT

BINARY  
 CHAR[(N)] [charset\_info] charset\_info  
 JSON  
 SIGNED [INTEGER] INTEGER(druid)  
 UNSIGNED [INTEGER] INTEGER (druid)

## 3.10.7 Bit Functions and Operators

Name	Description	Support
BIT_COUNT()	Return the number of bits that are set	Y
&	Bitwise AND	Y
~	Bitwise inversion	Y
	Bitwise OR	Y
^	Bitwise XOR	Y
<<	Left shift	Y
>>	Right shift	Y

## 3.10.8 Aggregate (GROUP BY) Functions

Name	Description	Support
AVG()	Return the average value of the argument	Y
BIT_AND()	Return bitwise AND	Y
BIT_OR()	Return bitwise OR	Y
BIT_XOR()	Return bitwise XOR	Y
COUNT()	Return a count of the number of rows returned	Y
COUNT(DISTINCT)	Return the count of a number of different values	Y
GROUP_CONCAT()	Return a concatenated string	Y
JSON_ARRAYAGG()	Return result set as a single JSON array	N
JSON_OBJECTAGG()	Return result set as a single JSON object	N
MAX()	Return the maximum value	Y
MIN()	Return the minimum value	Y
STD()	Return the population standard deviation	Y
STDDEV()	Return the population standard deviation	Y
STDDEV_POP()	Return the population standard deviation	Y
STDDEV_SAMP()	Return the sample standard deviation	Y
SUM()	Return the sum	Y
VAR_POP()	Return the population standard variance	Y
VAR_SAMP()	Return the sample variance	Y
VARIANCE()	Return the population standard variance	Y

: STD VARIANCE

STD() / STDDEV() / STDDEV\_POP() / STDDEV\_SAMP() / VAR\_POP() / VAR\_SAMP() / VARIANCE() result precision is not corr

AVG\SUMdbleMySQL

MySQLMySQL,

for data type float, dble and mysql may get different results

## 3.10.9 JSON Functions

Name	Description	Support

JSON_EXTRACT()	selected from the parts of the json document matched by the path arguments	Y
JSON_UNQUOTE()	Unquotes JSON value and returns the result as a utf8mb4 string.	Y

### 3.10.10 Full-Text Search Functions

not supported

### 3.10.11 XML Functions

not supported

### 3.10.12 Encryption and Compression Functions

not supported

### 3.10.13 Information Functions

not supported

### 3.10.14 Spatial Analysis Functions

not supported

### 3.10.15 Functions Used with Global Transaction IDs

not supported

### 3.10.16 MySQL Enterprise Encryption Functions

not supported

### 3.10.17 Miscellaneous Functions

not supported

[MySQL5.7](#)

## 3.11

### 3.11.1

1. workbench
- 2.dbeaver
3. mysqldump
4. navicat
5. mysqlsource load data

### 3.11.2

1. mysqldump mysqldump dble

```
./mysqldump -h127.0.0.1 -utest -P3306 -p111111 --default-character-set=utf8mb4 --master-data=2 --single-transaction --set-gtid-purged=off
--hex-blob --databases schema1 > export.sql
```

- 1.
2. dbledble

**4**

- [4.1](#)
- [4.2](#)
- [4.3](#)
- [4.4 \(Prepared Statements\)](#)
- [4.5](#)

## 4.1

- 
- 16M
- , bootstrap.cnf
-

## 4.2

### 4.2.1 Authentication Plugin

a.(mysql\_native\_password 8.0caching\_sha2\_password)

b.mysql\_native\_password

c.caching\_sha2\_password

### 4.2.2 Capabilities

dble

jdbc dble CLIENT\_FOUND\_ROWS

dble IGNORE\_SPACE select @@sql\_mode IGNORE\_SPACE

[MySQL issue-972](#)

IGNORE\_SPACE sessionsql\_mode

dble

CLIENT_LONG_PASSWORD	1	Use the improved version of Old Password Authentication. Assumed to be set since 4.1.1.	Y	Y
CLIENT_FOUND_ROWS	2	Send found rows instead of affected rows in EOF_Packet	Y	Y
CLIENT_LONG_FLAG	4	Get all column flags.	Y	Y
CONNECT_WITH_DB	8	Database (schema) name can be specified on connect in Handshake Response Packet.	Y	Y
CLIENT_NO_SCHEMA	16	Don't allow database.table.column.	N	N
CLIENT_COMPRESS	32	Compression protocol supported	bootstrap.cnfuseCompression	
CLIENT_ODBC	64	Special handling of ODBC behavior. No special behavior since 3.22.	Y	Y
CLIENT_LOCAL_FILES	128	Can use LOAD DATA LOCAL.	Y	Y
CLIENT_IGNORE_SPACE	256	Ignore spaces before '('.	Y	Y
CLIENT_PROTOCOL_41	512	New 4.1 protocol	Y	Y
CLIENT_INTERACTIVE	1024	This is an interactive client.	Y	Y
CLIENT_SSL	2048	Use SSL encryption for the session	N	N
CLIENT_IGNORE_SIGPIPE	4096	Client only flag. Not used.	Y	Y
CLIENT_TRANSACTIONS	8192	Client knows about transactions	Y	Y
CLIENT_RESERVED	16384	DEPRECATED: Old flag for 4.1 protocol.	N	N
CLIENT_RESERVED2	32768	DEPRECATED: Old flag for 4.1 authentication.	Y	Y
CLIENT_MULTI_STATEMENTS	65536	Enable/disable multi-stmt support	Y	Y
CLIENT_MULTI_RESULTS	131072	Enable/disable multi-results	Y	Y
CLIENT_PS_MULTI_RESULTS	262144	Multi-results and OUT parameters in PS-protocol	N	N
CLIENT_PLUGIN_AUTH	524288	Client supports plugin authentication.	N	Y
CLIENT_CONNECT_ATTRS	1048576	Client supports connection attributes.	N	N

CLIENT_PLUGIN_AUTH_LE_NENC_CLIENT_DATA	2097152	Enable authentication response packet to be larger than 255 bytes.	N	N
CLIENT_CAN_HANDLE_EXPIRED_PASSWORDS	4194304	Don't close the connection for a user account with expired password.	N	N
CLIENT_SESSION_TRACK	8388608	Capable of handling server state change information.	N	N
CLIENT_DEPRECATED_EOF	16777216	Client no longer needs EOF_Packet and will use OK_Packet instead.	N	N
CLIENT_SSL_VERIFY_SERVER_CERT	1UL << 30	Verify server certificate	N	N
CLIENT_REMEMBER_OPTIONS	1UL << 31	Don't reset the options after an unsuccessful connect.	N	N

:

[https://dev.mysql.com/doc/dev/mysql-server/8.0.13/group\\_group\\_cs\\_capabilities\\_flags.html](https://dev.mysql.com/doc/dev/mysql-server/8.0.13/group_group_cs_capabilities_flags.html)

## 4.3

### 4.3.1 Supported

- COM\_INIT\_DB  
Specifies the default schema for the connection.
- COM\_PING  
Sends a packet containing one byte to check that the connection is active.
- COM\_QUERY  
Sends the server an SQL statement to be executed immediately. Support Multi-Statement.
- COM\_QUIT  
Client tells the server that the connection should be terminated.
- COM\_SET\_OPTION  
Enables or disables server option.
- COM\_CHANGE\_USER  
Resets the connection and re-authenticates with the given credentials.
- COM\_RESET\_CONNECTION  
Resets a connection without re-authentication.
  - (rollback & unlock)
  - 
  - 
  - 
  - prepare
  - ()
  - LAST\_INSERT\_ID
- COM\_FIELD\_LIST  
MySQL Doc said that it is deprecated from 5.7.11 . But some tools are still use it, like OGG or MariaDB client.

#### 4.3.1.1 Multi-Statement

- Supported
  - DML:select/insert/update/replace/delete
  - DDL
  - OTHER
    - BEGIN;
    - COMMIT;
    - LOCK TABLE
    - UNLOCK TABLES
    - START
    - KILL
    - USE
    - ROLLBACK
    - MYSQL\_CMD\_COMMENT
    - MYSQL\_COMMENT
    - SELECT VERSION\_COMMENT ( SELECT @@VERSION\_COMMENT)
    - SELECT DATABASE select database()
    - SELECT USERselect user()
    - SELECT VERSION (select version())
    - SELECT SESSION\_INCREMENT(select @@session.auto\_increment\_increment)
    - SELECT SESSION\_ISOLATION(select @@session.tx\_isolation)
    - SELECT LAST\_INSERT\_ID(select last\_insert\_id(#) as id )
    - SELECT IDENTITY(select @@identity)
    - SELECT SESSION\_TX\_READ\_ONLYselect @@session.tx\_read\_only
- Not Supported
  - EXPLAIN
  - EXPLAIN2
  - DESCRIBE
  - SET
  - SHOW DATABASES/TABLES/TABLE\_STATUS/COLUMNS/INDEX/CREATE\_TABLE/VARIABLES/CREATE\_VIEW/CHARSET
  - HELP
  - LOAD\_DATA\_INFILE\_SQL
  - CREATE\_VIEW
  - REPLACE\_VIEW
  - ALTER\_VIEW
  - DROP\_VIEW

### 4.3.2 Not Supported

- COM\_DEBUG  
Forces the server to dump debug information to stdout
- COM\_STATISTICS  
Get internal server statistics.
- COM\_CREATE\_DB
- COM\_DROP\_DB

#### 4.3.3 Internal

- COM\_SLEEP  
Used inside the server only.
- COM\_CONNECT an internal command in the server.
- COM\_TIME an internal command in the server.
- COM\_DAEMON an internal command in the server.
- COM\_DELAYED\_INSERT an internal command in the server.

#### 4.3.4 Deprecated

- COM\_PROCESS\_INFO  
Deprecated from 5.7.11.
- COM\_PROCESS\_KILL  
Deprecated from 5.7.11.
- COM\_SHUTDOWN  
Deprecated from 5.7.9.
- COM\_REFRESH  
Deprecated from 5.7.11.

## 4.4 (Prepared Statements)

### 4.4.1

- jdbcuseServerStmts server-side prepare client-side prepare
- driver

java

```
PreparedStatement preparedStatement = con.prepareStatement("select t1.id from no_sharding_t1 t1 where t1.id=?"); //dble prepare assert pr
eparedStatement instanceof ServerPreparedStatement;
```

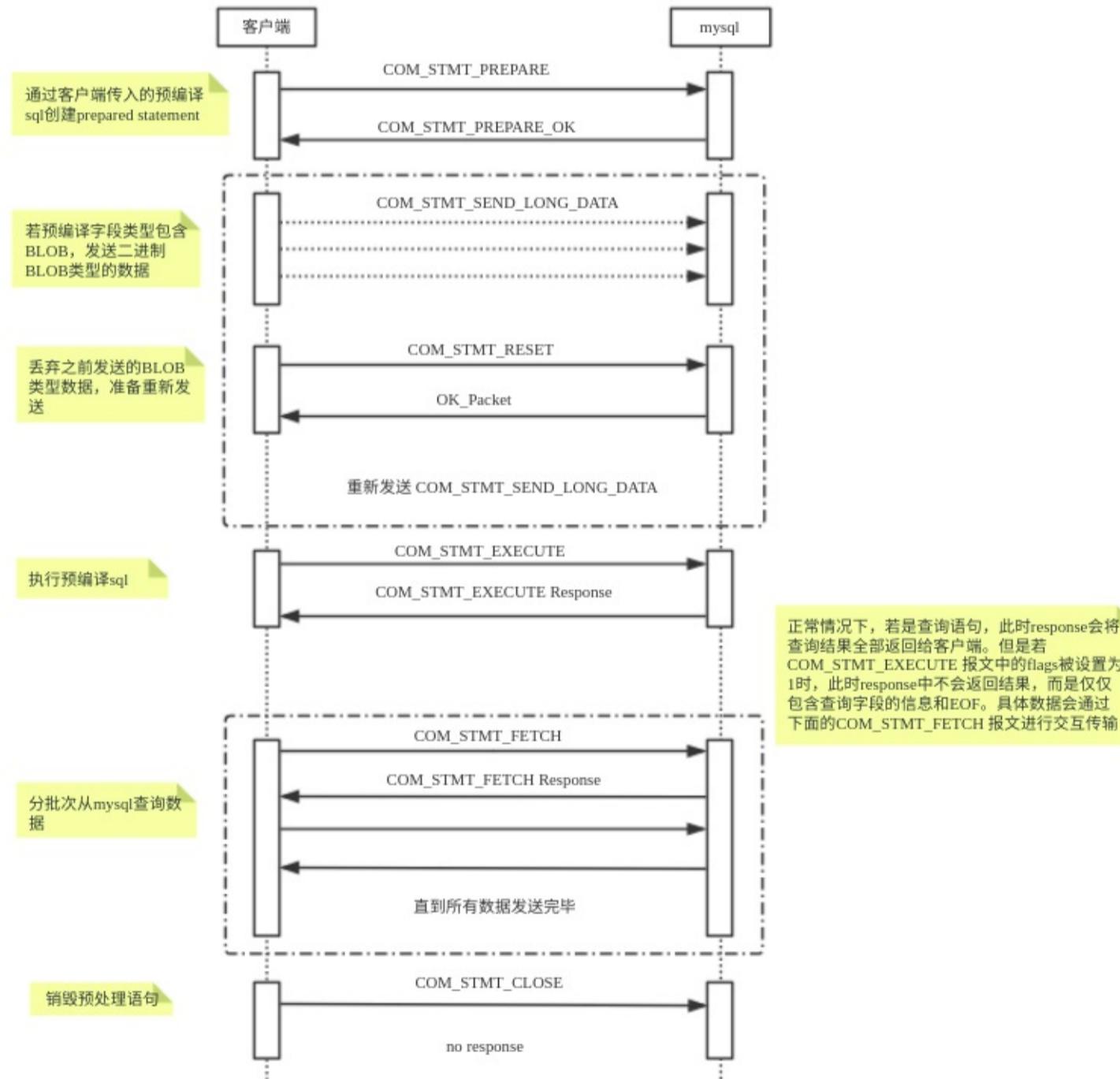
### 4.4.2

mysql

### 4.4.4

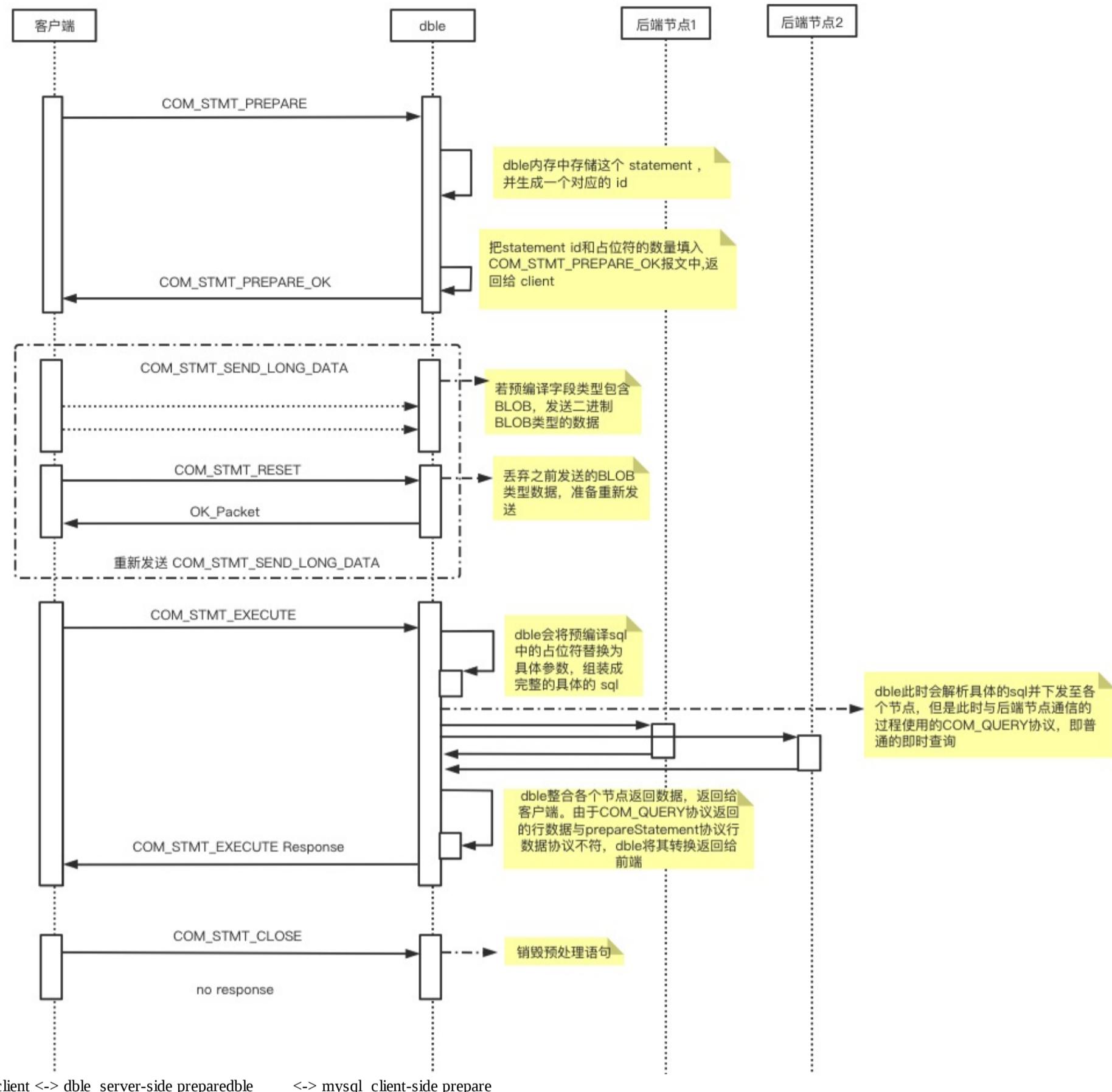
- server-side prepare client PS server server
- client-side prepare : client PS prepare SQL server server ""

### 4.4.5 MySQL



- urluseCursorFetch=true&server
- jdbcfetchSize=0&jdbcfetchSize > 0&fetchprepareStatement

### 4.4.6 Dble



#### 4.4.7

- **COM\_STMT\_CLOSE**  
Closes a previously prepared statement.
  - **COM\_STMT\_EXECUTE**  
Executes a previously prepared statement.
  - **COM\_STMT\_RESET**  
Resets a prepared statement on client and server to state after preparing.
  - **COM\_STMT\_SEND\_LONG\_DATA**  
When data for a specific column is big, it can be sent separately.
  - **COM\_STMT\_PREPARE**  
Prepares a statement on the server
- NOTICE:** Although COM\_STMT\_PREPARE works, but dble will not do pre-compile.
- **COM\_STMT\_FETCH**  
Fetches rows from a prepared statement

#### 4.4.8 Dble

##### 4.4.8.1

- server-side cursorserverclient
- client-side cursor: client tcp socket(server client)
- client-side cursorclient client cursor cursor API client

#### 4.4.8.2

##### DBLE

- <3.21.02,
- =3.21.02,
- >3.21.02, bootstrap.cnf-DenableCursor=true

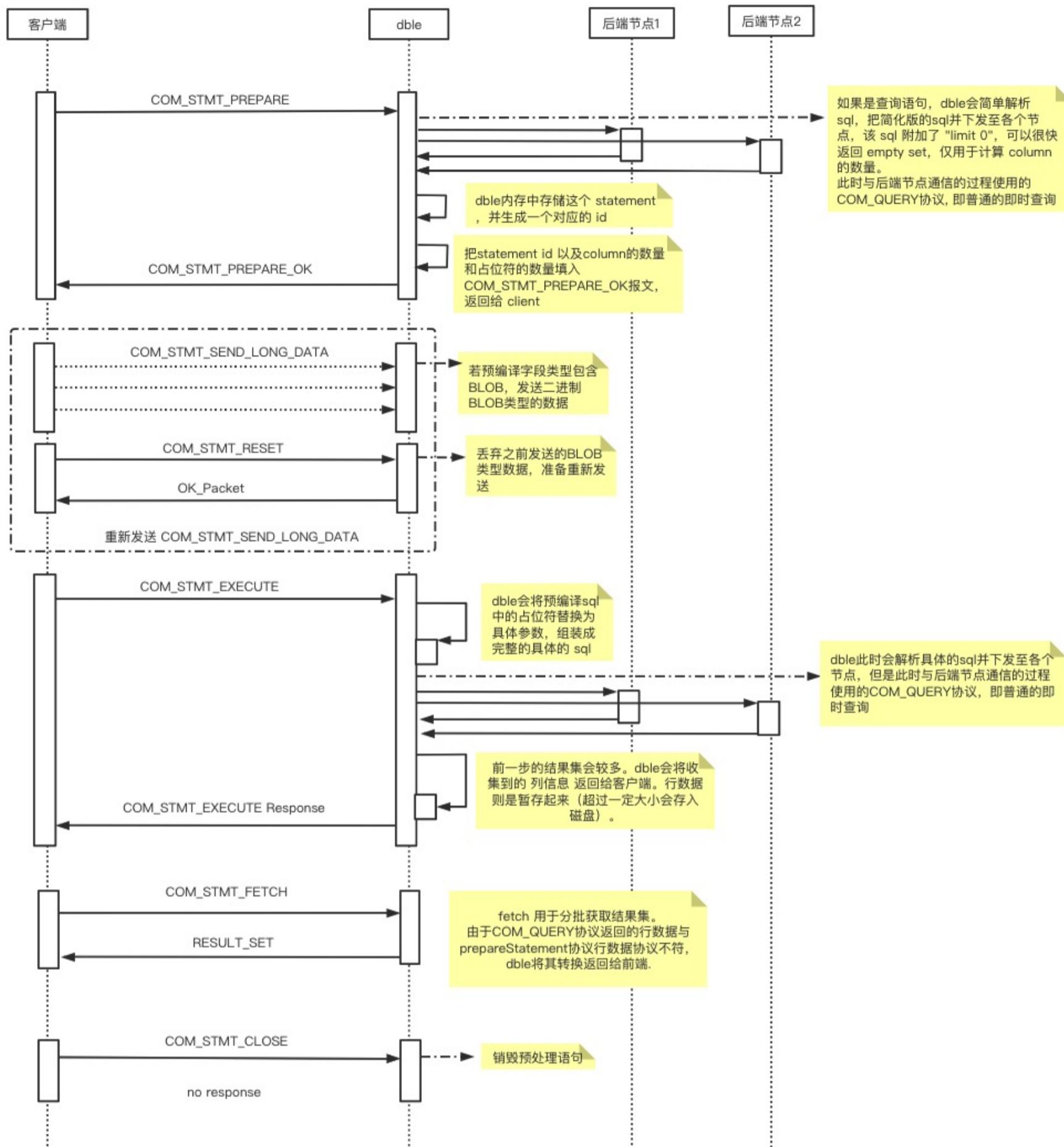
1. drivermysqljdbc driver
2. jdbcuseServerPrepStmtsuseCursorFetch
3. prepareStatement fetchSize 0.
4. execute

resultSet fetchSize dble

4, useServerFetch

```
final ResultSet resultSet = preparedStatement.executeQuery();
//server-side
Method method = com.mysql.cj.jdbc.StatementImpl.class.getDeclaredMethod("useServerFetch");
method.setAccessible(true);
Boolean useServerFetch = (Boolean) method.invoke(preparedStatement);
assert useServerFetch==true;
```

#### 4.4.8.3 Dble Server-side Cursor Flow



1. preparesql client
2. execute
3. fetch

#### 4.4.8.4

- maxHeapTableSize
- heapTableBufferChunkSize

[https://actiontech.github.io/dble-docs-cn/1.config\\_file/1.02\\_bootstrap.cnf.html](https://actiontech.github.io/dble-docs-cn/1.config_file/1.02_bootstrap.cnf.html)

## 4.5

- EOF\_Packet
- ERR\_Packet
- OK\_Packet
- LOCAL\_INFILE Packet
- PACKET\_LOCAL\_INFILE
- PACKET\_RESULTSET

**5.**

- [5.1 druid](#)
- [5.2](#)

## 5.1 druid

1. INSERT ... VALUE ... INSERT ... VALUES ...VALUE[S]

druidbugVALUES[S]druid

druid[issue2218](#)

dbleissue [dble\\_issue\\_379](#).

2. SHOW ALL TABLES dble

3.

[dble\\_issue\\_788](#)

## 5.2

1. `:parentkey`  
issue : <https://github.com/actiontech/dble/issues/12>
2. `JDBCrewriteBatchedStatements=true`  
:  
`insert : insertinsert.. values(),(),com_query dble`
3. `JDBCuseServerPrepStmts=true`  
: dbleBinary Protocol Text Protocol
4. lock/unlock  
issue : <https://github.com/actiontech/dble/issues/38>
5. schema.xml3.20.07.0  
: schema.xml  
issue : <https://github.com/actiontech/dble/issues/70>
6. dbletabledble, dble
7. /  
: sql  
issue : <https://github.com/actiontech/dble/issues/85>
8. : dropjavatcp\_keepalive  
issue : <https://github.com/actiontech/dble/issues/87>
9. /  
:  
issue : <https://github.com/actiontech/dble/issues/100>
10. `order by lock in share mode/for update`, lock clause is ignored  
:  
issue : <https://github.com/actiontech/dble/issues/127>
11. `_charset_name 'string' _charset_name+b'val'`  
issue : <https://github.com/actiontech/dble/issues/262>  
issue : <https://github.com/actiontech/dble/issues/267>
12. `set sql_select_limit`  
issue : <https://github.com/actiontech/dble/issues/331>
13. sEndDatedefault node  
:  
issue : <https://github.com/actiontech/dble/issues/357>
14. selece @@sql\_mode IGNORE\_SPACE  
: 4.2  
issue : <https://github.com/actiontech/dble/issues/364>
15. replace ... into  
replace replaceIDIDID
16. kill sessionok
17. 2.19.01rule/schema/server.xmlversionBUG2.19.01zkversion
18. mysql set global local\_infile = 0 ,dble load data  
: dbleload data load data local infile ... mysql local\_infile  
issue : <https://github.com/actiontech/dble/issues/1111>
19. set @@sql\_auto\_is\_null=on; : set @@sql\_auto\_is\_null=on null,dble  
issue : <https://github.com/actiontech/dble/issues/978>
20. explain . issue <https://github.com/actiontech/dble/issues/1449>
21. enableCursor prepareStatement prepare mysql
22. XAsql
23. `select group by truefalse`  
group by truefalsemysqlInnoDBPRIMARY KEYPRIMARY KEYINSERTdbleINSERTmysql  
issue : <https://github.com/actiontech/dble/issues/3177>



## 6. MySQL Server

MySQL ServerbugMySQL

- [6.1](#)
- [6.2 INSERT](#)
- [6.3 "show all tables"](#)
- [6.4 message](#)
- [6.5 information\\_schema](#)

## 6.1 MySQL

:

MySQL:

```
[test_yhq]>select * from char_columns_4;
+----+-----+
| id | c_char |
+----+-----+
| 1 | xx |
| 4 | z |
+----+-----+
2 rows in set (0.02 sec)

[test_yhq]>begin;
Query OK, 0 rows affected (0.01 sec)

[test_yhq]>insert into char_columns_4 values(1,'yy');
ERROR 1062 (23000): Duplicate entry '1' for key 'PRIMARY'
[test_yhq]>insert into char_columns_4 values(2,'yy');
Query OK, 1 row affected (0.00 sec)

[test_yhq]>commit;
Query OK, 0 rows affected (0.02 sec)
```

dble:

```
[testdb]>select * from sharding_four_node order by id;
+----+-----+-----+
| id | c_flag | c_decimal |
+----+-----+-----+
| 1 | 1_1 | 1.0000 |
| 2 | 2 | 2.0000 |
| 3 | 3 | 3.0000 |
+----+-----+-----+
3 rows in set (0.28 sec)

begin;
Query OK, 0 rows affected (0.01 sec)

[testdb]>insert into sharding_four_node values(1,'1',1.0);
ERROR 1062 (23000): Duplicate entry '1' for key 'PRIMARY'
[testdb]>insert into sharding_four_node values(13,'13',13.0);
ERROR 1003 (HY000): Transaction error, need to rollback.Reason:[errNo:1062 Duplicate entry '1' for key 'PRIMARY']
[testdb]>commit;
ERROR 1003 (HY000): Transaction error, need to rollback.Reason:[errNo:1062 Duplicate entry '1' for key 'PRIMARY']
```

## 6.2 INSERTdbleMySQL

:

MySQL:

```
desc mysql_autoinc;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| c_char | char(255) | YES | | NULL | |
| id | bigint(20) | NO | PRI | NULL | auto_increment |
+-----+-----+-----+-----+-----+
2 rows in set (0.02 sec)
```

```
[test_yhq]>insert into mysql_autoinc values('1',1);
Query OK, 1 row affected (0.01 sec)
```

dble

```
desc sharding_four_node_autoinc;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| c_char | char(255) | YES | | NULL | |
| id | bigint(20) | NO | PRI | NULL | auto_increment |
+-----+-----+-----+-----+-----+
2 rows in set (0.01 sec)
[testdb]>insert into sharding_four_node_autoinc values('2',2);
ERROR 1064 (HY000): In insert Syntax, you can't set value for Autoincrement column!
```

## 6.3 ADD "show all tables"

The optional ALL modifier causes SHOW TABLES to display a second output column with values of BASE TABLE for a table ,VIEW for a view, SHARDING TABLE for a sharding table and GLOBAL TABLE for a global table.

:

```
[testdb]>show all tables;
+-----+-----+
| Tables in testdb | Table_type |
+-----+-----+
| global_four_node | GLOBAL TABLE |
| global_four_node_autoinc | GLOBAL TABLE |
| global_two_node | GLOBAL TABLE |
| sbtest1 | SHARDING TABLE |
| sharding_four_node | SHARDING TABLE |
| sharding_four_node2 | SHARDING TABLE |
| sharding_four_node_autoinc | SHARDING TABLE |
| sharding_two_node | SHARDING TABLE |
| single | SHARDING TABLE |
| customer | BASE TABLE |
| district | BASE TABLE |
+-----+-----+
11 rows in set (0.02 sec)
```

## 6.4 message

:

MySQL:

```
mysql> insert into sharding_two_node values(9,'9',9.0),(10,'10',10.0);
Query OK, 2 rows affected (0.24 sec)
Records: 2 Duplicates: 0 Warnings: 0
```

dble:

```
mysql> insert into sharding_two_node values(11,'11',11.0),(12,'12',12.0);
Query OK, 2 rows affected (0.49 sec)
```

## 6.5 information\_schema

Navicat Premium 12 dbleNavicat Premium 12 information\_schemamysql  
dble driver

### Navicat Premium12

1. SELECT SCHEMA\_NAME, DEFAULT\_CHARACTER\_SET\_NAME, DEFAULT\_COLLATION\_NAME FROM information\_schema.SCHEMATA;

```
mysql schemecharacter set collationNavicat Premium 12
dblescheme SchemeConfig scheme scheme character set collation
1dbleschemeshardingNodeshardingNode character set collation character set collation ,MySQL
2dbe SCHEMATA
```

### driver

0

```
1. SELECT TABLE_SCHEMA, TABLE_NAME, TABLE_TYPE
 FROM information_schema.TABLES WHERE TABLE_SCHEMA = 'testdb'
 ORDER BY TABLE_SCHEMA, TABLE_TYPE
2. SELECT TABLE_SCHEMA, TABLE_NAME, COLUMN_NAME, COLUMN_TYPE
 FROM information_schema.COLUMNS
 WHERE TABLE_SCHEMA = 'testdb'
 ORDER BY TABLE_SCHEMA, TABLE_NAME
3. SELECT DISTINCT ROUTINE_SCHEMA, ROUTINE_NAME, PARAMS.PARAMETER
 FROM information_schema.ROUTINES LEFT JOIN
 (SELECT SPECIFIC_SCHEMA, SPECIFIC_NAME,
 GROUP_CONCAT(CONCAT(DATA_TYPE, ' ', PARAMETER_NAME) ORDER BY ORDINAL_POSITION SEPARATOR ', ') PARAMETER, ROUTINE_TYPE
 FROM information_schema.PARAMETERS GROUP BY SPECIFIC_SCHEMA, SPECIFIC_NAME, ROUTINE_TYPE
)PARAMS
 ON ROUTINES.ROUTINE_SCHEMA = PARAMS.SPECIFIC_SCHEMA AND
 ROUTINES.ROUTINE_NAME = PARAMS.SPECIFIC_NAME AND
 ROUTINES.ROUTINE_TYPE = PARAMS.ROUTINE_TYPE
 WHERE ROUTINE_SCHEMA = 'testdb' ORDER BY ROUTINE_SCHEMA
4. SELECT TABLE_NAME, CHECK_OPTION, IS_UPDATABLE, SECURITY_TYPE, DEFINER
 FROM information_schema.VIEWS
 WHERE TABLE_SCHEMA = 'testdb' ORDER BY TABLE_NAME ASC
5. SELECT * FROM information_schema.ROUTINES
 WHERE ROUTINE_SCHEMA = 'testdb' ORDER BY ROUTINE_NAME
6. SELECT EVENT_CATALOG, EVENT_SCHEMA, EVENT_NAME, DEFINER, TIME_ZONE,
 EVENT_DEFINITION, EVENT_BODY, EVENT_TYPE, SQL_MODE, STATUS, EXECUTE_AT,
 INTERVAL_VALUE, INTERVAL_FIELD, STARTS, ENDS, ON_COMPLETION, CREATED,
 LAST_ALTERED, LAST_EXECUTED, ORIGINATOR, CHARACTER_SET_CLIENT,
 COLLATION_CONNECTION, DATABASE_COLLATION, EVENT_COMMENT
 FROM information_schema.EVENTS WHERE EVENT_SCHEMA = 'testdb'
 ORDER BY EVENT_NAME ASC
7. SELECT COUNT(*) FROM information_schema.TABLES
 WHERE TABLE_SCHEMA = 'testdb' UNION
 SELECT COUNT(*)
 FROM information_schema.COLUMNS
 WHERE TABLE_SCHEMA = 'testdb' UNION
 SELECT COUNT(*) FROM information_schema.ROUTINES WHERE ROUTINE_SCHEMA = 'testdb'
```

**7**

- [7.1 SQL](#)
- [7.2 dbleDemo](#)
- [7.3](#)

## 7.1 SQL

- SQLSQLSQL

1

```
dbledbleSQLSQL SQLdbeSQLSQLSQL dbleMySQL dbleEXPLAINdbe
```

```
explain select id,accountno from account where userid=2;
```

```
EXPLAINSQL EXPLAIN2
```

```
explain2 shardingNode=dn1 sql=select id,accountno from account where userid=2;
```

```
explain2sqlexplainshardingNodeexplain
```

## 2SQL

SQL:

- SQL
- 
- INININ
- SQLDISTINCTGROUP BYORDER BYSQL
- 

3

- Join
- 
- 
- 
- JoinJoinJoin
- Join
- JoinJoin
- limit a,b
- GROUP
- 
- Join

## 7.2 dbleDemo

### ibatis

ibatisdbleMySQL JDBC

```
jdbc.driverClass=com.mysql.jdbc.Driver
jdbc.jdbcUrl=jdbc:mysql://127.0.0.1:8066/TESTDB?useUnicode=true&characterEncoding=utf-8
jdbc.user=root
jdbc.password=123456
```

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE mapper
PUBLIC "-//mybatis.org//DTD Mapper 3.0//EN"
"http://mybatis.org/dtd/mybatis-3-mapper.dtd">
<mapper namespace="com.mapper.UserMapper">
 <insert id="saveUser" parameterType="com.bean.User">
 insert into user(id, name, phone, birthday)
 values (0, #{name}, #{phone}, #{birthday})
 <selectKey keyProperty="id" order="after" resultType="int">
 select last_insert_id() as id
 </selectKey>
 </insert>
 <delete id="deleteUserById" parameterType="java.lang.String">
 delete from user where id=#{id}
 </delete>
 <update id="updateUser" parameterType="com.bean.User">
 update user set name=#{name}, phone=#{phone}, birthday=#{birthday} where id=#{id}
 </update>
 <update id="updateUsers">
 /*!dble:sql=select * from user;*/update users set usercount=(select count(*) from user),ts=now()
 </update>
 <select id="getUserById" parameterType="java.lang.String" resultType="com.bean.User">
 select * from user where id=#{id}
 </select>
 <select id="getUsers" resultType="com.bean.User">
 select * from user
 </select>
```

select last\_insert\_id() as idID updateUsers dbleibatis##

### hibernate

hibernatedbleMySQL hibernate.cfg.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE hibernate-configuration PUBLIC
"--/Hibernate/Hibernate Configuration DTD 3.0//EN"
"http://www.hibernate.org/dtd/hibernate-configuration-3.0.dtd">
<hibernate-configuration>
 <session-factory>
 <property name="hibernate.connection.driver_class">com.mysql.jdbc.Driver</property>
 <property name="hibernate.connection.url">jdbc:mysql://192.168.58.51:8066/testdb?
useUnicode=true&characterEncoding=utf-8</property>
 <property name="hibernate.connection.username">root</property>
 <property name="hibernate.connection.password">123456</property>
 <property name="hibernate.dialect">org.hibernate.dialect.MySQLInnoDBDialect</property>
 <property name="hibernate.format_sql">true</property>
 <property name="hibernate.hbm2ddl.auto">update</property>
 <mapping resource="com/actiontech/test/News.hbm.xml"/>
 </session-factory>
</hibernate-configuration>
```

News.hbm.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE hibernate-mapping PUBLIC
 "-//Hibernate/Hibernate Mapping DTD 3.0//EN"
 "http://www.hibernate.org/dtd/hibernate-mapping-3.0.dtd">
<hibernate-mapping>
 <class name="com.actiontech.test.News" table="news_table">
 <id name="id" type="java.lang.Integer">
 <column name="id" />
 </id>
 <property name="title" type="java.lang.String">
 <column name="title" />
 </property>
 <property name="content" type="java.lang.String">
 <column name="content" />
 </property>
 </class>
</hibernate-mapping>
```

News.java

```
package com.actiontech.test;
public class News {
 private Integer id;
 private String title;
 private String content;
 public Integer getId() {
 return id;
 }
 public void setId(Integer id) {
 this.id = id;
 }
 public String getTitle() {
 return title;
 }
 public void setTitle(String title) {
 this.title = title;
 }
}
```

public String getContent() { return content; } public void setContent(String content) { this.content = content; } }&lt;/pre&gt; NewsManager.java

```
package com.actiontech.test;
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.Transaction;
import org.hibernate.cfg.Configuration;
public class NewsManager {
 public static void main(String[] args)
 throws Exception {
 Configuration config = new Configuration().configure();
 SessionFactory factory = config.buildSessionFactory();
 Session session = factory.openSession();
 Transaction transaction = session.beginTransaction();
 News news = new News();
 news.setId(10);
 news.setTitle("dble");
 news.setContent("Hibernate dble");
 session.save(news);
 transaction.commit();
 session.close();
 factory.close();
 }
}
```

dbleHibernateHibernateSQLSQL

**JDBC**

## JDBCdbleMySQL

```

package com.actiontech.test;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.sql.Statement;
import java.util.Properties;
import java.util.concurrent.CountDownLatch;
import java.util.concurrent.atomic.AtomicLong;
public class SingleMixEngine {
 public static void main(String[] args) throws Exception {
 Class.forName("com.mysql.jdbc.Driver");
 Properties props = new Properties();
 props.setProperty("user", "root");
 props.setProperty("password", "123456");
 SingleMixEngine engine = new SingleMixEngine();
 engine.execute(props, "jdbc:mysql://192.168.58.51:8066/testdb");
 }
 final AtomicLong tmAl = new AtomicLong();
 final String tableName="news_table";
 public void execute(Properties props, String url) {
 CountDownLatch cdl = new CountDownLatch(1);
 long start = System.currentTimeMillis();
 for (int i = 0; i < 1; i++) {
 TestThread insertThread = new TestThread(props, cdl, url);
 Thread t = new Thread(insertThread);
 t.start();
 System.out.println("Test start");
 }
 try {
 cdl.await();
 long end = System.currentTimeMillis();
 System.out.println("Test end, total cost:" + (end-start) + "ms");
 } catch (Exception e) {
 }
 }
}

class TestThread implements Runnable {
 Properties props;
 private CountDownLatch countDownLatch;
 String url;
 public TestThread(Properties props, CountDownLatch cdl, String url) {
 this.props = props;
 this.countDownLatch = cdl;
 this.url = url;
 }
 public void run() {
 Connection connection = null;
 PreparedStatement ps = null;
 Statement st = null;
 try {
 connection = DriverManager.getConnection(url, props);
 connection.setAutoCommit(true);
 st = connection.createStatement();
 String dropSql = "drop table if exists " + tableName;
 System.out.println("Execute SQL:\n\t" + dropSql);
 st.execute(dropSql);

 String createSql = "create table " + tableName + "(id int, title varchar(20), content varchar(50))";
 System.out.println("Execute SQL:\n\t" + createSql);
 st.execute(createSql);

 String insertSql = "insert into " + tableName + " (id, title, content) values (?, ?, ?)";
 System.out.println("Prepared SQL:\n\t" + insertSql);
 ps = connection.prepareStatement(insertSql);
 for (int i = 1; i <= 3; i++) {
 ps.setInt(1, i);
 ps.setString(2, "" + i);
 ps.setString(3, "" + i + "");
 ps.execute();
 System.out.println("Insert data:\t" + i + ", " + i + ", " + i + "");
 }
 }
 }
}

```



### 7.3

- 
- MySQL
- 
- DDLDDL

**8**

- [8.1](#)
- [8.2 MySQL-offset-step](#)

## 8.1

tbidid

### 1cluster.conf

```
sequenceHandlerType=2
sequenceStartTime=2010-10-01 09:42:54
...
...
```

### 2bootstrap.conf

```
instanceId=1
...
...
```

### 3user.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<dble:user xmlns:dble="http://dble.cloud/">
 <managerUser name="test" password="test"/>
 <shardingUser name="abc" password="abc" schemas="myschema" maxCon="1000000">
 </shardingUser>

</dble:user>
```

### 4db.xml

```
<?xml version="1.0"?>
<dble:db xmlns:dble="http://dble.cloud/">
 <dbGroup name="host_1" rwSplitMode="0" delayThreshold="10000">
 <heartbeat>select USER()</heartbeat>
 <dbInstance name="hostM1" url="172.100.10.101:3306" user="test1" password="test1" maxCon="1000" minCon="1000" primary="true" />
 </dbGroup>
 <dbGroup name="host_2" rwSplitMode="0" delayThreshold="10000">
 <heartbeat>select USER()</heartbeat>
 <dbInstance name="hostM2" url="172.100.10.102:3306" user="test1" password="test1" maxCon="1000" minCon="1000" primary="true" />
 </dbGroup>
</dble:db>
```

### 5sharding.xml

```
<?xml version="1.0"?>
<dble:sharding xmlns:dble="http://dble.cloud/">
 <schema name="myschema" shardingNode="dn1">
 <shardingTable name="sbtest1" shardingNode="dn1,dn2" function="mod" shardingColumn="id" incrementColumn="id" />
 </schema>
 <shardingNode name="dn1" dbGroup="host_1" database="dble"/>
 <shardingNode name="dn2" dbGroup="host_2" database="dble"/>
 <function name="mod" class="Hash">
 <property name="partitionCount">2</property>
 <property name="partitionLength">1</property>
 </function>
</dble:sharding>
```

## 6

```
``mysql mysql -utest -p111111 -h127.0.0.1 -P8066 -Dmyschema mysql> drop table if exists sbtest1; Query OK, 0 rows affected (0.05 sec) mysql> create table sbtest1(id
bigint(20), k int unsigned not null default '0', primary key(id)); Query OK, 0 rows affected (0.05 sec)

mysql> insert into sbtest1 values(2); Query OK, 1 row affected (0.11 sec)

mysql> select * from sbtest1;
bigint
```

## 8.2 MySQL-offset-step

sbtest1idMySQL-offset-stepid

### 1cluster.conf

```
sequenceHandlerType=1
...

```

### 2user.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<dble:user xmlns:dble="http://dble.cloud/" >
 <managerUser name="test" password="test"/>

 <shardingUser name="abc" password="abc" schemas="myschema" maxCon="1000000">
 </shardingUser>

</dble:user>
```

### 3db.xml

```
<?xml version="1.0"?>
<dble:db xmlns:dble="http://dble.cloud/" >
 <dbGroup name="host_1" rwSplitMode="0" delayThreshold="10000">
 <heartbeat>select USER()</heartbeat>
 <dbInstance name="hostM1" url="172.100.10.101:3306" user="test1" password="test1" maxCon="1000" minCon="1000" primary="true" />
 </dbGroup>
 <dbGroup name="host_2" rwSplitMode="0" delayThreshold="10000">
 <heartbeat>select USER()</heartbeat>
 <dbInstance name="hostM2" url="172.100.10.102:3306" user="test1" password="test1" maxCon="1000" minCon="1000" primary="true" />
 </dbGroup>
</dble:db>
```

### 4sharding.xml

```
<?xml version="1.0"?>
<dble:sharding xmlns:dble="http://dble.cloud/" >
 <schema name="myschema" shardingNode="dn1">
 <shardingTable name="sbtest1" shardingNode="dn1,dn2" function="mod" shardingColumn="id" incrementColumn="id" />
 </schema>
 <shardingNode name="dn1" dbGroup="host_1" database="dble"/>
 <shardingNode name="dn2" dbGroup="host_2" database="dble"/>

 <function name="mod" class="Hash">
 <property name="partitionCount">2</property>
 <property name="partitionLength">1</property>
 </function>
</dble:sharding>
```

### 5sequence\_db\_conf.properties

```
#sequence stored in shardingNode
`myschema`.`sbtest1`=dn1
```

myschema, sbtest1, dn1sharding.xml

dn1host\_1/dbledbleconf/dbseq.sql()

```
mysql -h172.100.10.101 -utest1 -ptest1 -Ddble
mysql>source conf/dbseq.sql
```

sqlDBLE\_SEQUENCE

```
mysql -h172.100.10.101 -utest1 -ptest1 -Ddble
mysql>INSERT INTO DBLE_SEQUENCE VALUES ('`myschema`.`sbtest1`', 16, 1);
```

## DBLE\_SEQUENCE

- namesequence\_db\_conf.properties
- current\_value
- increment1

**6**

dbe

```
mysql -utest -p111111 -h127.0.0.1 -P8066 -Dmyschema
mysql> drop table if exists sbtest1;
Query OK, 0 rows affected (0.05 sec)
mysql> create table sbtest1(id int, k int unsigned not null default '0', primary key(id));
Query OK, 0 rows affected (0.05 sec)

mysql> insert into sbtest1 values(2);
Query OK, 1 row affected (0.11 sec)

mysql> select * from sbtest1;
+----+---+
| id | k |
+----+---+
| 17 | 2 |
+----+---+
1 row in set (0.01 sec)
```

sqlDBLE\_SEQUENCEcurrent\_value16insert17

- sequence\_db\_conf.properties

```
`myschema`.`sbtest1`=dn1
```

- sequence\_db\_conf.propertiesdn1dbseq.sql

## 9 sysbenchdbe

- [9.1](#)
- [9.2 dble](#)
- [9.3 sysbench](#)

## 9.1

- Sysbench version: 1.0
- Dble version: 5.6.23-dble-2.19.11.0-2d7c4911b7a4fecaa9eb0299f49c32ec11e97c42-20200228124218
- MySQL version: 5.7.25

- sysbench172.20.134.1
- dble172.20.134.2
- 3mysql172.20.134.3172.20.134.4172.20.134.5

2.18

## 1. bootstrap.cnf

```
-DNIOFrontRW=10 -DNIOBackendRW=10 -DfrontWorker=8 -DbackendWorker=6 -DsqlExecuteTimeout=3000000
```

## 2.user.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<dble:user xmlns:dble="http://dble.cloud/" version="4.0">
 <managerUser name="root" password="111111" />
 <shardingUser name="test" password="111111" schemas="sbtest" maxCon="1000000">
 </shardingUser>
</dble:user>
```

## 3.db.xml

```
<?xml version="1.0"?>
<dble:db xmlns:dble="http://dble.cloud/" version="4.0">
 <dbGroup name="host_1" rwSplitMode="0" delayThreshold="-1">
 <heartbeat>select USER()</heartbeat>
 <dbInstance name="hostM1" url="172.20.134.3:3306" user="test1" password="test1" maxCon="1000" minCon="100" primary="true"/>
 </dbGroup>
 <dbGroup name="host_2" rwSplitMode="0" delayThreshold="-1">
 <heartbeat>select USER()</heartbeat>
 <dbInstance name="hostM1" url="172.20.134.4:3306" user="test1" password="test1" maxCon="1000" minCon="100" primary="true"/>
 </dbGroup>
 <dbGroup name="host_3" rwSplitMode="0" delayThreshold="-1">
 <heartbeat>select USER()</heartbeat>
 <dbInstance name="hostM1" url="172.20.134.5:3306" user="test1" password="test1" maxCon="1000" minCon="100" primary="true"/>
 </dbGroup>
</dble:db>
```

## 4.sharding.xml

```
<?xml version="1.0"?>
<dble:sharding xmlns:dble="http://dble.cloud/" version="4.0">
 <schema name="sbtest">
 <shardingTable name="sbtest1" shardingNode="dn$1-9" function="hash-sysbench" shardingColumn="id" />
 </schema>
 <shardingNode name="dn$1-3" dbGroup="host_1" database="dbledb$1-3" />
 <shardingNode name="dn$4-6" dbGroup="host_2" database="dbledb$4-6" />
 <shardingNode name="dn$7-9" dbGroup="host_3" database="dbledb$7-9" />
 <function name="hash-sysbench" class="Hash">
 <property name="partitionCount">9</property>
 <property name="partitionLength">1</property>
 </function>
</dble:sharding>
```

## 5.mysql

- 172.20.134.3:3306 dbledb1, dbledb2, dbledb3
- 172.20.134.4:3306 dbledb4, dbledb5, dbledb6
- 172.20.134.5:3306 dbledb7, dbledb8, dbledb9

## 9.3 sysbench

how about a [sysbench-testing-quick-start](#); issue

sysbench

```
FATAL: mysql_drv_query() returned error 1062 (Duplicate entry '49823' for key 'PRIMARY') for query 'INSERT INTO sbtest1 (id, k, c, pad) VA
LUES (49823, 58210, '27111667985-11552069038-79242882109-05602914209-02374993639-32242662584-65155028223-08319627673-44873060047-222151189
36', '07405724915-32799061660-96650146042-59717172693-66753749407')'
```

```
/usr/share/sysbench/oltp_read_write.lua --mysql-db=sbtest --mysql-host=172.20.134.2 --mysql-port=8066 --mysql-user=test --mysql-password=111111 --auto_inc=off -
-tables=1 --table-size=100000 --threads=4 --time=30 --report-interval=1 --max-requests=0 --percentile=95 --db-ps-mode=disable --skip-trx=on cleanup
```

```
/usr/share/sysbench/oltp_read_write.lua --mysql-db=sbtest --mysql-host=172.20.134.2 --mysql-port=8066 --mysql-user=test --mysql-password=111111 --auto_inc=off -
-tables=1 --table-size=100000 --threads=4 --time=30 --report-interval=1 --max-requests=0 --percentile=95 --db-ps-mode=disable --skip-trx=on prepare
```

```
/usr/share/sysbench/oltp_read_write.lua --mysql-db=sbtest --mysql-host=172.20.134.2 --mysql-port=8066 --mysql-user=test --mysql-password=111111 --auto_inc=off -
-tables=1 --table-size=100000 --threads=4 --time=30 --report-interval=1 --max-requests=0 --percentile=95 --db-ps-mode=disable --skip-trx=on run
```

- [A.1 ErrorCode](#)
- [A.2](#)
- [A.3](#)

- Max Connections
- Out Of Memory Error
- The Problem Of Hint
- NestLoop Parameters Lead To Temptable Exception
- Can't Get Variables From ShardingNode
- Port Already In Use 1984
- Sharding Column Cannot Be Null

## dble-MaxConnections

### Issue

- [Err] 3009 - java.io.IOException: the max activeConnections size can not be max than maxconnections.

### Resolution

1. dble
2. maxConmaxCon

		/	
maxCon		1024	,.maxcon maxConmanager

### Root Cause

### Relevant Content

1. **maxWait**
  - maxActive
2. **connectionProperties**
  - connectTimeout socketTimeout connectTimeout TCP socketTimeout
    - socket socket DB
3. **maxActive**
  - maxWait 0

## dble-OutOfMemoryError

### Setting

load data17G4K  
load data

### Issue

- INFO | jvm 1 | 2019/06/28 14:55:37 | Exception in thread "backendBusinessExecutor17" java.lang.OutOfMemoryError: GC overhead limit exceeded.

Special instructions backendBusinessExecutor17 17-backendWorker

### Resolution

- maxRowSizeToFile

maxCharsPerColumn		65535	
maxRowSizeToFile		10000	load dataOOM

- wrapper.confXmx

OOM

### Root Cause

- maxRowSizeToFile
- Xmx

On-Heap JVM Xms ,Xmx jvm

### Relevant Content

#### load data

load dataOOM

#### JVM

- dble=0.6 (,)
- Xmx = 0.4 dble
- MaxDirectMemorySize = 0.6 \* dble

- JVM-Xms1/64
- JVM-Xmx1/4
- 40%JVM-Xmx70%JVM-Xms

## dble-TheProblemOfHint

### Setting

- mysql> /\*#dble:sql=select 1 from rp\_cre\_data\_mobile\_track\_cmcc / call update\_track();
- sql
- 

### Issue

- mysql> show @@processlist;

Front_Id	shardingNode	BconnID	user	Front_Host	db	Command	Time	State	Info
33	NULL	NULL	root		NULL	NULL	0	updating	NULL
34	NULL	NULL	root		NULL	NULL	0	updating	NULL
35	NULL	NULL	root		NULL	NULL	0	updating	NULL
41	dn9	9372	root		db9	Query	0	updating	NULL
42	NULL	NULL	root		NULL	NULL	0	updating	NULL
43	NULL	NULL	root		NULL	NULL	0	updating	NULL
30	NULL	NULL	admin		NULL	NULL	0	updating	NULL

### Resolution

- /\*#dble:type=..../
- !/dble:type=..../
- mysql client -c

```
mysql --help
-c, --comments
Preserve comments. Send comments to the server. The default is --skip-comments (discard comments), enable with --comments.
```

### Root Cause

- /\*#dble:type=..../ mysql
- c skip

### Relevant Content

#### hint

- /\*
- dbleinsert...select...

#### Hint

##### Hint

- /\*!dble:type=....\*/
- /\*#dble:type=...\*/
- /\* \*/()

type4shardingNodedb\_typesql\_db\_instance\_url  
type [https://actiontech.github.io/dble-docs-cn/2.Function/2.04\\_hint.html](https://actiontech.github.io/dble-docs-cn/2.Function/2.04_hint.html)

#### Hint

- selectSQLdelete/update/insert delete/update/insert SQL
- SQL
- hintDDLreload @@metadata
- hintsession
- dbleMySQL, MySQL#1169
- SQLSQL select id from tab\_a where id='10000'
-



## dble-NestLoop Parameters Lead To Temptable Exception

### Setting

- NestLoopNestLoop4
- joinstudentclass
- studentidnameclass\_nameid
- classidclass\_nameteacher\_name
- `SELECT class.teacher_name FROM student LEFT JOIN class on student.class_name=class.class_name WHERE student.name=""`

### Issue

- com.actiontech.dble.plan.common.exception.TempTableException: temptable too much rows,[rows size is 5].

### Resolution

- NestLoop

		/	
useJoinStrategy	nestLoop		joinwhereSQL
nestLoopConnSize		4	
nestLoopRowsSize		2000	

- NestLoop
  - `<property name="useJoinStrategy">false</property>`
- 

### Root Cause

- NestLoopNestLoopNestLoop
- NestLoop
  - joinNestLoop join
  - wherewhere
  - wherewhereNestLoop
  - NestLoop
- SQL
  - `SELECT class.teacher_name FROM student LEFT JOIN class on student.class_name=class.class_name WHERE student.name=""`

dbleNestLoop

1. SQLstudentclass
2. wherestudentNestLoopstudent
3. SQLstudentNestLoop

### Relevant Content

#### MySQLNestLoop

1. NestLoop:
  - Nested Loop
  - Nested LoopJoinJoin Nested Loop
  - Nested Loop“”——
2. NestLoop

NestLoop		CPUI/O	
----------	--	--------	--

## dble-Can't get variables from shardingNode

### Setting

- db.xml

```
<dbGroup name="localhost1" rwSplitMode="0" delayThreshold="10000">
<heartbeat>show slave status</heartbeat>
<dbInstance host="hostM1" url="localhost:3306" user="root" password="nE7jA%5m" maxCon="1000" minCon="10" primary="true" > </dbInstance>
</dbGroup>
<dbGroup name="localhost2" rwSplitMode="0" delayThreshold="10000">
<heartbeat>show slave status</heartbeat>
<dbInstance host="hostM2" url="localhost:3306" user="root" password="nE7jA%5m" maxCon="1000" minCon="10" primary="true"> </dbInstance>
</dbGroup>
```

### Issue

- dble

```
Running dble-server...
wrapper | --> Wrapper Started as Console
wrapper | Launching a JVM...
jvm 1 | Wrapper (Version 3.2.3)
http://wrapper.tanukisoftware.org
jvm 1 | Copyright 1999-2006 Tanuki Software, Inc. All Rights Reserved.
jvm 1 |
jvm 1 | java.io.IOException:Can't get variables from shardingNode ...
wrapper | <-- Wrapper Stopped
```

### Resolution

1. mysqlmysql5.1mysql,
2. db.xmlrootmysql
3. root
4. mysqlshow variables
5. dbGroupdble

### Root Cause

- db.xml mysqlshow variables
- mysql 5.7

### Relevant Content

1. mysql5.7
2. mysqlmysqlMysql
3.
  - mysql> show databases;
  - ERROR 1820 (HY000): You must reset your password using ALTER USER statement before executing this statement.
  - mysql > set password = password('xxxxxx');

## dble-Port already in use:1984

### Issue

- wrapper.log-Error1

```
STATUS | wrapper | 2019/07/23 16:37:06 | --> Wrapper Started as Daemon
STATUS | wrapper | 2019/07/23 16:37:06 | Launching a JVM...
INFO | jvm 1 | 2019/07/23 16:37:06 | OpenJDK 64-Bit Server VM warning: ignoring option MaxPermSize=64M; support was removed in 8.0
INFO | jvm 1 | 2019/07/23 16:37:07 | : : java.rmi.server.ExportException: Port already in use: 1984; nested exception is:
INFO | jvm 1 | 2019/07/23 16:37:07 | java.net.BindException: Address already in use (Bind failed)
INFO | jvm 1 | 2019/07/23 16:37:07 | sun.management.AgentConfigurationError: java.rmi.server.ExportException: Port already in use: 198
4;
```

- wrapper.log-Error2

```
STATUS | wrapper | 2019/07/26 16:12:48 | --> Wrapper Started as Daemon
STATUS | wrapper | 2019/07/26 16:12:49 | Launching a JVM...
INFO | jvm 1 | 2019/07/26 16:12:49 | Wrapper (Version 3.2.3) http://wrapper.tanukissoftware.org
INFO | jvm 1 | 2019/07/26 16:12:49 | Copyright 1999-2006 Tanuki Software, Inc. All Rights Reserved.
INFO | jvm 1 | 2019/07/26 16:12:49 |
INFO | jvm 1 | 2019/07/26 16:12:51 | java.net.BindException: Address already in use
INFO | jvm 1 | 2019/07/26 16:12:51 | at sun.nio.ch.Net.bind0(Native Method)
INFO | jvm 1 | 2019/07/26 16:12:51 | at sun.nio.ch.Net.bind(Net.java:433)
INFO | jvm 1 | 2019/07/26 16:12:51 | at sun.nio.ch.Net.bind(Net.java:425)
INFO | jvm 1 | 2019/07/26 16:12:51 | at sun.nio.ch.ServerSocketChannelImpl.bind(ServerSocketChannelImpl.java:223)
INFO | jvm 1 | 2019/07/26 16:12:51 | at com.actiontech.dble.net.NIOAcceptor.<init>(NIOAcceptor.java:46)
```

### Resolution

- Error1  
wrapper.conf1984  
-Dcom.sun.management.jmxremote.port=1984
- Error2  
netstat -nap pid80669066  
kill -9 pid
- dble

### Root Cause

- jmxjavadble
- dblejvmjmx
- jmxjconsolejvmjvm

### Relevant Content

1. JVM  
JVMJavaJava  
JavaJavaacc++
2. JMX  
JMXJava Management ExtensionsJava  
JPAMMS
3. Jconsole  
JconsoleJDKJVMjava

## dble-Sharding column can't be null

### Setting

- sharding.xml

```
<sharingTable shadingColumn="number" ... >
...
<function name="rangeLong" class="NumberRange">
 <property name="mapFile">partition.txt</property>
 <property name="defaultNode">0</property>
</function>
```

- create table account (id int(10),number int(10) not null,name varchar(20) not null);
- insert into account (id,number,name) values (1,NULL,'aaa');

### Issue

ERROR 1064 (HY000): Sharding column can't be null when the table in MySQL column is not null

### Resolution

- numbernameNULL
- numberNULL;
- ALTER TABLE account MODIFY number VARCHAR (20);
- blacklistalterTableAllow;

```
<blacklist name="bk1">
 <property name="alterTableAllow">true</property>
</blacklist>
```

sharding-by-rangedbleERalter

```
<sharingTable shadingColumn="id" ... >
```

- alter

### Root Cause

- MySQLInsert
 

ERROR 1048 (23000): Column 'number' cannot be null
- descnumbername

Field	Type	Null	Key	Default	Extra
id	int(10)	YES		NULL	
number	int(10)	NO		NULL	
name	varchar(20)	NO		NULL	

- How To Use Explain To Resolve The Distribution Rules Of Group Gy
- Hash And ConsistentHashing And Jumpstringhash

## dble-How To Use Explain To Resolve The Distribution Rules Of Group Gy

### Questions

group by

### Conclusions

- 1. explainsql
  2. dble explainmycatSQL

### For Example

1.

sharding.xml

```
<shardingTable name="eee" shardingNode="dn1,dn2" function="hashLong" shardingColumn="id"/>
...
<function name="hashLong" class="Hash">
 <property name="partitionCount">2</property>
 <property name="partitionLength">128</property>
</function>
```

1. dble client eee mysql> select \* from eee;

```
| id | name | -- | -- | 1 | 2 | 3 | 4 | 5 | 130 | 131 | 132 | 133 | 134 |
```

mysql> select name,count(name) from eee group by name;

name	COUNT(name)
	4
	4
	1
	1

1. explainsql

SHARDING_NODE	TYPE	SQL/REF
dn1_0	BASE SQL	select eee . name ,COUNT(name) as _\$COUNT\$_rpda_0 from eee GROUP BY eee . name ASC
dn2_0	BASE SQL	select eee . name ,COUNT(name) as _\$COUNT\$_rpda_0 from eee GROUP BY eee . name ASC
merge_1	MERGE	dn1_0; dn2_0
aggregate_1	AGGREGATE	merge_1
shuffle_field_1	SHUFFLE_FIELD	aggregate_1

### Instructions

explain

1. dblesqlshardingnode
2. shardingnodemerge
3. mergegroup by
4. SHUFFLE\_FIELD

SHUFFLE\_FIELD

### Relevant Content

dble

1. dbleappmysq
- 2.

- /
- dblejoingroup by
- <https://opensource.actionsky.com/dble-lesson-one/>

**dble**

1. IO MySQLsql
2. MySQL
3. MySQL

| PSdble

## dble-Hash And ConsistentHashing And Jumpstringhash

### Questions

- dblehashhash
- hash

### Conclusions

- dblehashhash
- hashhash

### Instructions

#### dble-hash

- 
- sharding.xml

```
<function name="hashLong" class="hash">
<property name="partitionCount">1,2</property>
<property name="partitionLength">10,20</property>
</function>
```

- 

```
<function name="hashLong" class="hash">
<property name="partitionCount">4</property>
<property name="partitionLength">10</property>
</function>
```

partitionCount  
partitionLength  
MC1L1 + ... + CnLn

dble-hash

Count=2,Length=2 -> [0,2][2,4) -> =4

key1,2,3,4,5,6,7,8

node1	node2
1,4,5,8	2,3,6,7

Count=3,Length=2 -> [0,2][2,4)[4,6) -> =6 key1,2,3,4,5,6,7,8

node1	node2	node3
1,6,7	2,3,8	4,5

count

### summary

node

### Consistent Hashing

NodeANode BNode CNode DABCDANode ABNode BCNode CDNode D:

A —> NodeA  
B —> NodeB  
C —> NodeC  
D —> NodeD

Node CABDCNode D Node X:

```
A ----> NodeA
B ----> NodeB
 ----> NodeX
C ----> NodeC
D ----> NodeD
```

ABDCNode X

Hash node

""

NodeANode B "Node A#1" "Node A#2" "Node A#3" "Node B#1" "Node B#2" "Node B#3"  
 "Node A#1" "Node A#2" "Node A#3" Node A, "Node B#1" "Node B#2" "Node B#3" Node B

```
Node A#1 ----> NodeA
Node A#2 ----> NodeA
Node A#3 ----> NodeA
Node B#1 ----> NodeB
Node B#2 ----> NodeB
Node B#3 ----> NodeB
```

"""

### **summary**

hashnode

## **Jumpstringhash**

- 
- sharding.xml

```
<function name="jumpHash" class="jumpStringHash">
<property name="partitionCount">2</property>
<property name="hashSlice">0:2</property>
</function>
```

partitionCount hashSlice

GoogleA Fast, Minimal Memory, Consistent Hash Algorithmhash1/n

- 0,1,2,3
- $(0)1(1)1/(n+1)1/2(2)1/(n+1)1/3(3)1/(n+1)1/4$
- $n/(n+1)$   $1/(n+1)$   $n+1$
- indexmaxa0,1,2,33

0,1,2,30,1,2,3,4

### **summary**

Jumpstringhashhash

- Jumpstringhashhash
- Jumpstringhashhash
- Jumpstringhashhashdble-hash
- dble-hashJumpstringhashhash

- 
- ToBeContinued2

