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## 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

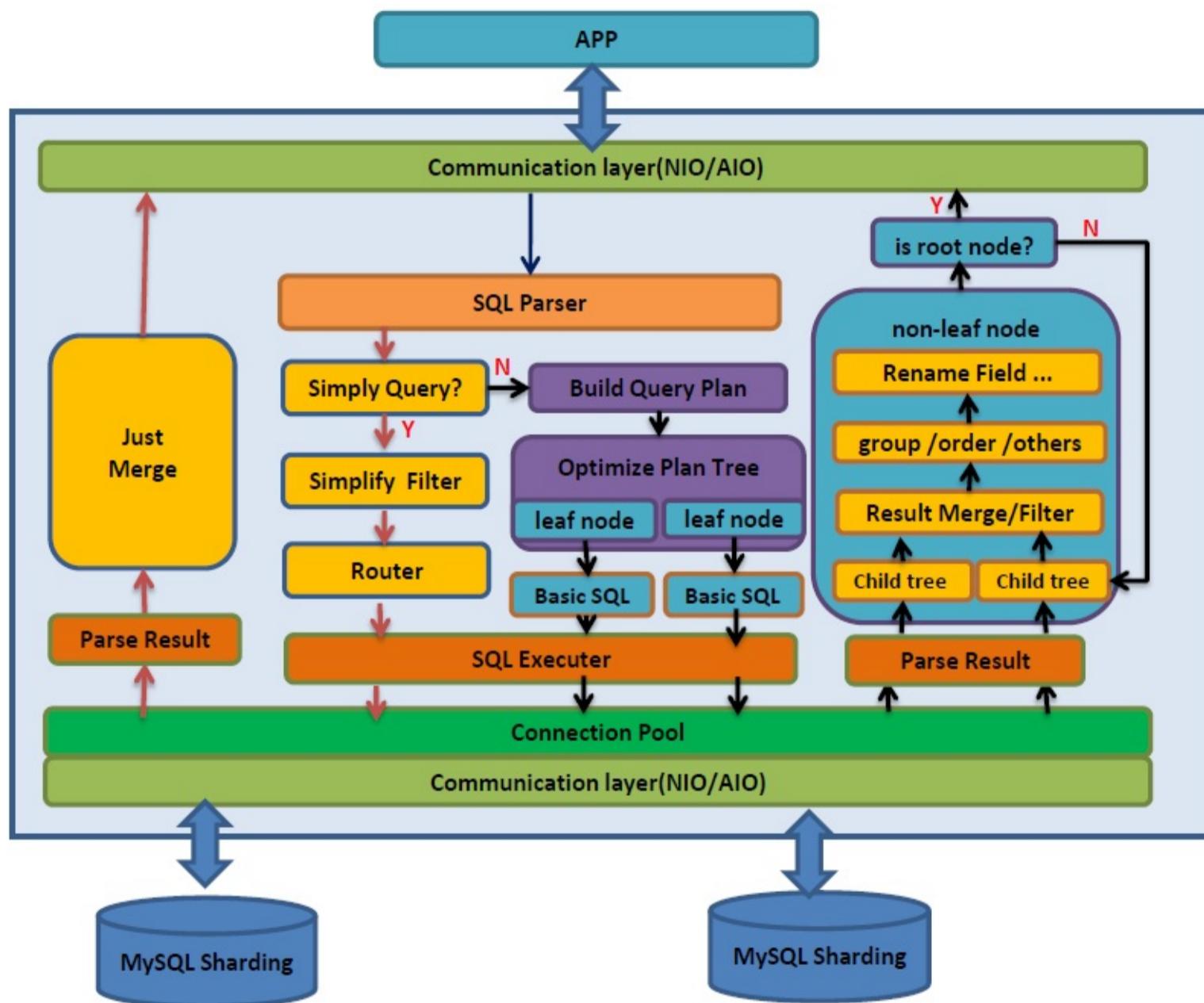
dbleMySQL

- 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

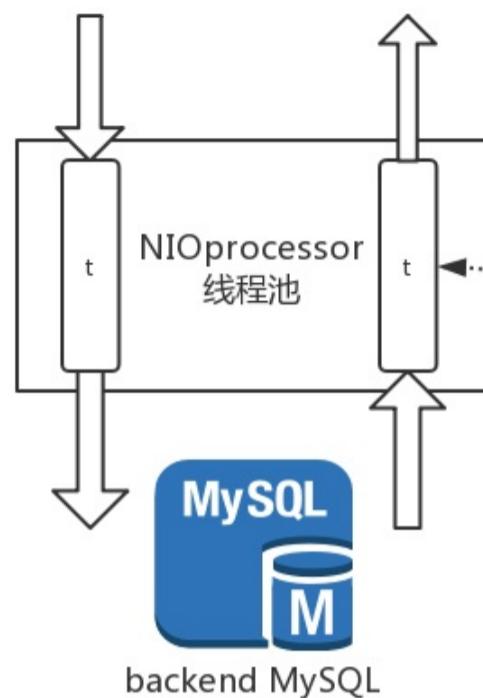
- HASH
- 
- set
- 
- writeTypewriteType = 1
- handleDistributedTransactions

#### 0.2.5

[DBLEMyCAT](#)

#### 0.2.6 2

Mycat以及dble 2.18.02之前版本

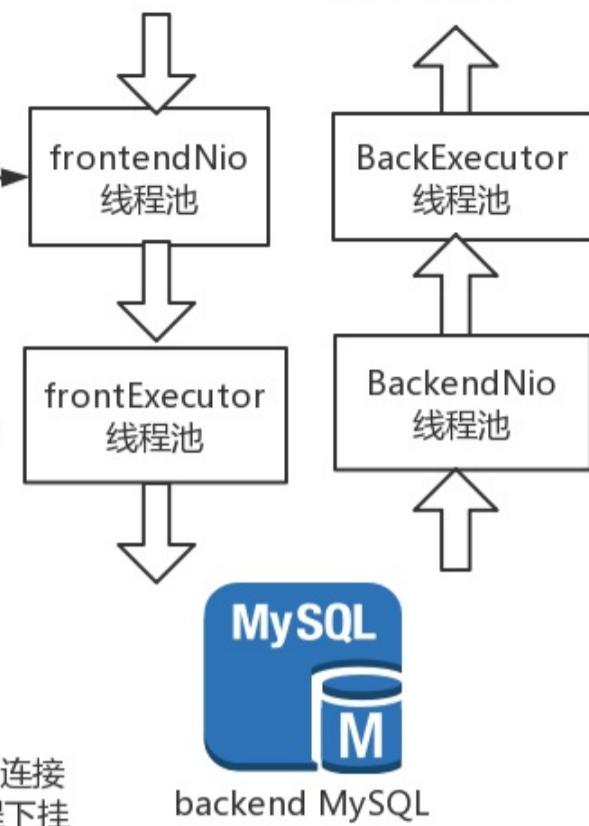


Nio处理器线程负责所有逻辑  
包括数据接收( IO )  
解析路由(内部计算)  
请求下发( IO )等

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 dble-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_File:
    Until_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_Error:
    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](#)

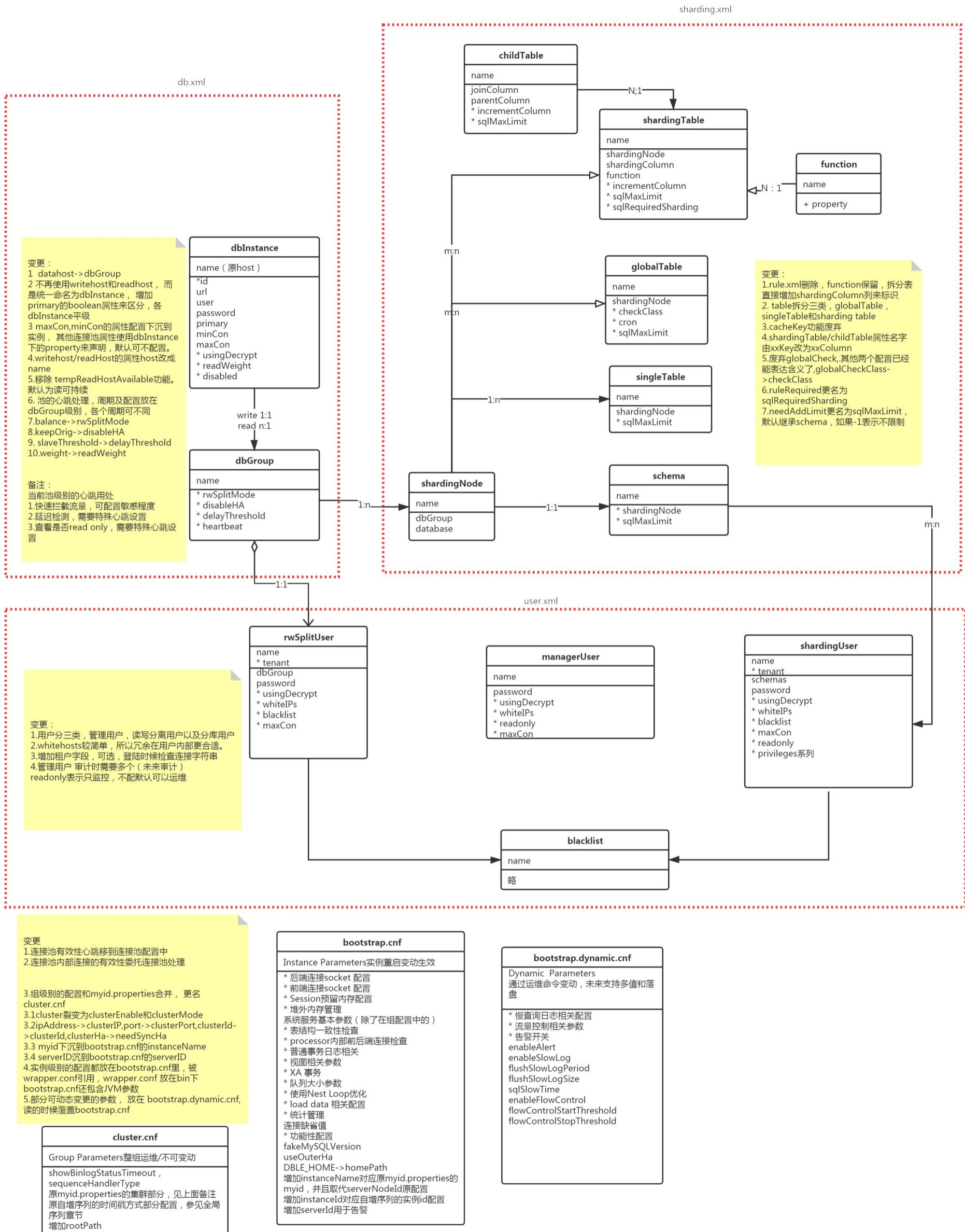
:

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<br>clusterID  |
| clusterMode             |           | zk/ucoreclusterEnable | zkzookeeperucore   |
| clusterIP               | IP        | clusterEnable         | clusterModezk<br>10.186.19.aa:2281,10.186.60.bb:2281<br>clusterModecoreucoreipIP |
| clusterPort             |           |                       | clusterModezkclusterModeucore<br>ucore   |
| rootPath                |           | clusterEnable         |  |
| clusterId               | dble      | clusterEnable         | dbledble   |
| needSyncHa              | ha        | true/falsefalse       | trueuseOuterHattrue  |
| showBinlogStatusTimeout | binlog    | 60000 ,               | binlog   |
| sequenceHandlerType     |           | 1~42                  | 1MySQL offset-step sequence<br>2(Snowflake)<br>3time(Snowflake)<br>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<br>viewConf<br>xatm<br>xalog<br>load<br>datatemp | ,         |      | ,                               |
|  | instanceName |   |           | xa   |                                 |
|  | instanceId   | id  |           |      | sequenceHandlerType=2<br>3.     |
|  |              |   |           |      | sequenceHandlerType=2<br>0~1023 |
|  |              |   |           |      | sequenceHandlerType=3<br>0~,511 |
|  | serverId     |   | IP        | dble |                                 |
|  | bindIp       | IP  | "0.0.0.0" | IP   | IP,                             |

|                      |   |           |  |        |
|----------------------|---|-----------|--|--------|
|                      |   |           |  |        |
| serverPort           |   | 8066      |  |        |
| managerPort          |   | 9066      |  |        |
| maxCon               |   | 0         | maxCon0,maxCon,,<br>maxcon<br>manager  | maxCon |
| NIOFrontRW           | NIOprocessors<br>NIOFrontRW<br>processors<br>NIOFrontRW   | java<br>, | IO   |        |
| NIOBackendRW         | NIO<br>backendProcessors<br>NIOBackendRW<br>backendProcessors<br>NIOBackendRW                                   | java<br>, | IO   |        |
| frontWorker          | processorExecutor<br>frontWorker<br>processorExecutor<br>frontWorker  | (2,)      |  |        |
| managerFrontWorker   |   | (2,/2)    | &  |        |
| backendWorker        | backendProcessorExecu<br>torbackendWorker<br>backendProcessorExecu<br>torbackendWorker                          | (2,)      |  |        |
| complexQueryWorker   | complexExecutor<br>complexQueryWorker<br>complexExecutor<br>complexQueryWorker                                  | (2,88     |  |        |
| writeToBackendWorker | SQL<br>writeToBackendExecuto<br>r<br>writeToBackendWorker<br>writeToBackendExecuto<br>r<br>writeToBackendWorker | (2,)      | SQL  |        |
| fakeMySQLVersion     | DbleMysql   | NULL      | MySQL,<br>+ Mysql,<br>+ MySQLMySQL<br>5.7.20<=<8.0.0 =""<br>="">=8.0.3<br>1.fakeMySQLVersion<br>5.7.20 mysql-version<br>5.7.25<br>2.fakeMySQLVersion<br>8.0.3 mysql-version<br>8.0.23<br>3.fakeMySQLVersion<br>5.7.15 mysql-version<br>8.0.1<br><b>Mysql</b> | 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)<br>dbInstancedbInstance<br>-1024.1024SQL         |   |
|                   | txIsolation                     |                   | 3               | SQL<br><br>dbledbInstancesession<br>sessionSQLsession<br>set | 1-<br>READ_UNCOMMITTED<br>2-READ_COMMITTED<br>3-REPEATABLE_READ<br>4-SERIALIZABLE |
|                   | autocommit                      |                   | 1               | dbledbInstance<br><br>sessionSQLsession<br>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<br>,show @@cost_time                     | 1-0-  |
|                   | maxCostStatSize                 |                   | 100             | show @@cost_time   |   |
|                   | costSamplePercent               |                   | 1/%             | costSamplePercent  |   |
|                   | checkTableConsistency           |                   | 0               | 1<br><br>DB  | 1-,0-   |
|                   | checkTableConsistency<br>Period |                   | 30×60×1000<br>, |  |   |
|                   | sqlExecuteTimeout               |                   | 300<br>,        |  |   |

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

|    |                                 |           |               |   |               |
|----|---------------------------------|-----------|---------------|---|---------------|
|    | maxResultSet                    |           | 512×1024<br>, | 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<br>false |
|    |                                 |           |               | -1<br>useJoinStrategy=true<br>useJoinStrategy |               |

|      |                           |                     |                              |  |                     |
|------|---------------------------|---------------------|------------------------------|--|---------------------|
| join | joinStrategyType          | nest loop           | -1nestloop                   | nestloop0<br>nestloop( useJoinStrategy)1<br>useJoinStrategy( useJoinStrategy),2<br>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<br>1SQL<br>2SQL3s   | 12                  |
|      | maxCharsPerColumn         |                     | 65535                        |  |                     |
|      | maxRowSizeToFile          | load data           | 100000                       | load data<br>OOMload<br>data,  |                     |
|      | enableBatchLoadData       | load data           | 0                            | load data<br>maxRowSizeToFile  | 01                  |
|      | enableFlowControl         | true/false          | false                        |  | true/false          |
|      | flowControlHighLevel      |                     | 41943044096K                 |  |                     |
|      | flowControlLowLevel       |                     | 262144256K                   |  |                     |
|      | enableCursor              | server-side-cursor. | false                        | prepare<br>statement 4.4   | true or false       |
|      | maxHeapTableSize          | ,byte               | 4096                         |  | 0                   |
|      | heapTableBufferChunkSize  | buffer cache        | bufferPoolChunkSize,<br>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<br>show @@sql.sum.tableshow<br>@@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<br>41004                                       | [0,100] |
|               | sqlLogTableSize                         | sql log   | 1024                | (sql)  |         |
|               | rwStickyTime                            | 0()   | 1000(ms), 0()       | SQLSQL<br>rwStickyTimeSQL()  | .       |
|               | district                                | dble,   | null                | db.xmlldbInstance<br>dbDistrict                                    |         |
|               | dataCenter                              | dble,   | null                | db.xmlldbInstance<br>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<br>Rotate |               | 1  | 1-0-   | 1-0- |
|     | sqlDumpLogSizeBasedRotate     |               | 50MB   | sqldump.log50MB :KBMBGB                                    |      |
|     | sqlDumpLogTimeBasedRotate     |               | 1  | 1  |      |
|     | sqlDumpLogDeleteFileAge       |               | 90d  | 90:d()h()m()<br>s()<br>sqlDumpLogCompressFilePatternlog4j2 |      |
|     | sqlDumpLogCompressFilePath    |               | */sqldump-*.log.gz                           | sqlDumpLogCompressFilePath<br>sqlDumpLogDeleteFileAge      |      |
| tcp | tcpKeepIdle                   | tcp-keepalive | 30s,   | dbleKeepalivejdk<br>2.38                                   |      |
|     | tcpKeepInterval               | tcp-keepalive | 10s  | dbletcp-keepalivejdk<br>2.38                               |      |
|     | tcpKeepCount                  | tcp-keepalive | 3  | tcp-keepalivejdk<br>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}<br>encrypt.sh 0:xxx:123456<br>fP/nl3XPXrSfWjpQzit5lOrRU1QRXu<br>LTYtATUG0fGW2k5kdXUhKL5zf02h<br>E6nGjdnSWrufVkJPUZpbQ2qX9uQ==<br>password<br>fP/nl3XPXrSfWjpQzit5lOrRU1QRXu<br>LTYtATUG0fGW2k5kdXUhKL5zf02h<br>E6nGjdnSWrufVkJPUZpbQ2qX9uQ==<br>user xxx<br>-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}<br>encrypt.sh 0:xxx:123456<br>fP/nl3XPXrSfWjpQzit5lOrRU1QRXu<br>LTYtATUG0fGW2k5kdXUhKL5zf02h<br>E6nGjdnSWrufVkJPUZpbQ2qX9uQ==<br>password<br>fP/nl3XPXrSfWjpQzit5lOrRU1QRXu<br>LTYtATUG0fGW2k5kdXUhKL5zf02h<br>E6nGjdnSWrufVkJPUZpbQ2qX9uQ==<br>user xxx<br>-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<br>1- 0- 1111 |
| table |        |      | tableschema                               |

**1.3.3.2 user.privileges.schema.table**

|      |     |      |   |
|------|-----|------|---|
|      |     | /    |   |
| name |     |      | key                                       |
| dml  | dml | 0000 | INSERT UPDATE SELECT DELETE<br>1- 0- 1111 |

**1.3.4 rwSplitUser()**

|              |           |                 |  |
|--------------|-----------|-----------------|--|
|              |           | /               |  |
| name         |           | mysql           |  |
| password     |           |                 |  |
| usingDecrypt |           | true/falsefalse | passwordencrypt.sh 0:{user}:{password}<br><br>encrypt.sh 0:xxx:123456<br>fP/nl3XPXrSfWjpQzit5lIOrRU1QRXu<br>LTYtATUG0fGW2k5kdXUhKL5zf02h<br>E6nGjdnSWrufVlkJPUZpbQ2qX9uQ==<br><br>password<br>fP/nl3XPXrSfWjpQzit5lIOrRU1QRXu<br>LTYtATUG0fGW2k5kdXUhKL5zf02h<br>E6nGjdnSWrufVlkJPUZpbQ2qX9uQ==<br>user xxx<br><br>-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}<br>encrypt.sh 0:xxx:123456<br>fP/nl3XPXrSfWjpQzit5IOrRU1QRXu<br>uLTYtATUG0fGW2k5kdXUhKL5zf02h<br>hE6nGjdnSWrufVkJPUZpbQ2qX9uQ==<br>password<br>fp/nl3XPXrSfWjpQzit5IOrRU1QRXu<br>uLTYtATUG0fGW2k5kdXUhKL5zf02h<br>hE6nGjdnSWrufVkJPUZpbQ2qX9uQ==<br>user xxx<br>-u xxx -p123456 |
| whiteIPs     | ip        |                 | whiteIPs   |
| tenant       |           |                 | tenant   |
| dbGroup      | dbGroup   |                 | db.xmldbGroup<br>dbGrouphybridTAUserapNode   |
| maxCon       |           |                 | ,0 maxConmaxCon  |
| blacklist    | blacklist |                 | blacklist  |

### 1.3.6 hybridTAUser(HTAP)

- HTAP

|              |           |                 |  |
|--------------|-----------|-----------------|--|
|              |           | /               |  |
| name         |           | mysql           |  |
| password     |           |                 |  |
| usingDecrypt |           | true/falsefalse | passworddecrypt.sh 0:{user}:{password}<br>encrypt.sh 0:xxx:123456<br>fP/nl3XPXrSfWjpQzit5IOrRU1QRX<br>uLTYtATUG0fGW2k5kdXUhKL5zf02h<br>hE6nGjdnSWrufVkJPUZpbQ2qX9uQ==<br>password<br>fp/nl3XPXrSfWjpQzit5IOrRU1QRX<br>uLTYtATUG0fGW2k5kdXUhKL5zf02h<br>hE6nGjdnSWrufVkJPUZpbQ2qX9uQ==<br>user xxx<br>-u xxx -p123456 |
| whiteIPs     | ip        |                 | whiteIPs   |
| readOnly     |           | true/falsefalse | DMLshowselect  |
| tenant       |           |                 | tenant   |
| schemas      | schema    |                 | schemaschemasharding.xmlschma<br>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<br>false | sql >1 true<br>false dble<br>Dble |  |  |  |

- sql

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

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

- sql  
expr

1.

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

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

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

## 2.select into

|  |  |  |  |  |               |  |  |
|--|--|--|--|--|---------------|--|--|
|  |  |  |  |  | sql           |  |  |
|  |  |  |  |  | select * into |  |  |

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

## 3.AlwayTrue

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

## 4.

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

|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|

## 5. functionCheck

|                |  |      |               |  |           |
|----------------|--|------|---------------|--|-----------|
| tableCheck     |  | true | true<br>false | druidble                                   | druiddble |
| functionCheck  |  | true | true<br>false | druidble                                   | druiddble |
| objectCheck    | ""   | true | true<br>false | druidble                                   | druiddble |
| variantCheck   | ""   | true | true<br>false | druidble                                   | druiddble |
| readOnlyTables | SELECT INTO<br>DELETEUPDATE<br>INSERTMERGE"" |      |               | SELECT INTO<br>DELETEUPDATE<br>INSERTMERGE | druiddble |
| schemaCheck    | Schema                                       | true | true<br>false | druidble                                   | druiddble |

## 6.

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

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### 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,<br>1<br>2<br>3  |
| delayThreshold    |               | -1              | 1:delayThresholdshow slave<br>status<br>2:delayPeriodMillisdelayDatabase<br>delay_detection<br>3:delayThreshold=-1<br>4:delayPeriodMillisdelayDatabase12 |
| delayPeriodMillis |               | -1              | delayThresholddelayDatabase  |
| delayDatabase     | mysqldatabase | null,           | mysqsqlmysqldatabase<br>delayThresholddelayPeriodMillis  |
| disableHA         |               | true/falsefalse |  |
| heartbeat         | ,             |                 | mysql.<br>:<br>1.select 1<br>2. select @@read_only<br>3.show slave status,<br>Seconds_Behind_Mastermysql   |
| dbInstance        |               |                 |  |

- heartbeat

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

- dbInstance

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

|              |       |        |  |
|--------------|-------|--------|--|
| maxCon       |       |        | numOfShardingNodes, minCon<br>maxCon<br>numOfShardingNodes minCon<br>,   |
| readWeight   | 0     |        | 0 0.<br>0  |
| primary      | true  | false  |  |
| disabled     |       | false  |  |
| databaseType |       | ,mysql | mysqlmysqlclickhouseclickhouse,<br>+ mysqlshardingUserrwSplitUser<br>+ clickhouseanalysisUserapNode<br>hybridTAUser, dbGroupdbInstance<br>databaseType<br>+ clickHousedb.xmlclickHouse<br>db.xmlmysqllower_case_table_names<br>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 | :<br>1.,<br>2.show slave status<br>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<br>1tableschema<br>2schematabledefault single table<br>3(function)schematabledefault<br>sharding table1.13 Schema |
| function           | sharding table   |      | function(shardingNodefunction)<br>1.13 Schema  |
| apNode             | OLAP(clickHouse) |      | apNodeOLAP<br>0apNode<br>1shardingUserschemaapNode<br>2hybridTAUserschemaapNode  |
| sqlMaxLimit        |                  | -1   | SQL<br>1 (order/group/)<br>2 schemasqlMaxLimit   |
| logicalCreateADrop |                  | true | trueschema   |
| shardingTable      | shardingTable    |      |  |
| globalTable        | globalTable      |      |  |
| singleTable        | singleTable      |      |  |

- shardingTable

|                     |                |                   |   |
|---------------------|----------------|-------------------|---|
|                     |                | /                 |   |
| name                |                |                   | ,   |
| shardingNode        |                |                   | xxx\$n0-n1<br>xxxn0, ..., xxxnm, ..., xxxn1<br>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"> <li>• globalTable</li> </ul> |                |                   |  |
| name  |                | /                 | ,  |
| shardingNode  |                |                   | xxx\$n0-n1<br>xxxn0, ..., xxxnm, ..., xxxn1<br>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<br>http://www.quartz-scheduler.org/api/2.4.0-SNAPSHOT/org/quartz/CronScheduleBuilder.html |
| <ul style="list-style-type: none"> <li>• singleTable</li> </ul> |                |                   |  |
| 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<br>databasedbGroup<br>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

shardingNodedatabasebGroup(shardingNode)shardingNodenameapNode

### 1.5.4 apNode

- apNode

apNodeshardingNode

|          | &                                   |  |
|----------|-------------------------------------|--|
| name     | "dn,dn\$0-5"                        | ,,’,X()05,"X\$0-5",\$name<br>databasedbGroup<br>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",\$<br>dbGroupdatabaseTypeclickhouse              |

&lt;apNode name="apNode1" dbGroup="localhost1" database="ap\_db1" /&gt;

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

n0 &lt; nm &lt; n1

&lt;apNode name="apNode1\$0-19" dbGroup="localhost1\$0-9" database="ap\_db1\$0-1" /&gt;

:

<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;

&lt;apNode name="dn,dn1\$0-19,dnx" dbGroup="localhost,localhost1\$0-9" database="db1\$0-1" /&gt;

,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

|   |            |                         |         |         |
|---|------------|-------------------------|---------|---------|
|   |            |                         |         |         |
| l | $l \geq 0$ | l                       |         | l       |
| l | $l < 0$    | $l = l + \text{length}$ | $l < 0$ | $l = 0$ |

b.r

|   |            |                         |                     |                     |
|---|------------|-------------------------|---------------------|---------------------|
|   |            |                         |                     |                     |
| r | $r > 0$    | r                       | $r > \text{length}$ | $r = \text{length}$ |
| r | $r \leq 0$ | $r = r + \text{length}$ |                     | r                   |

*length.*

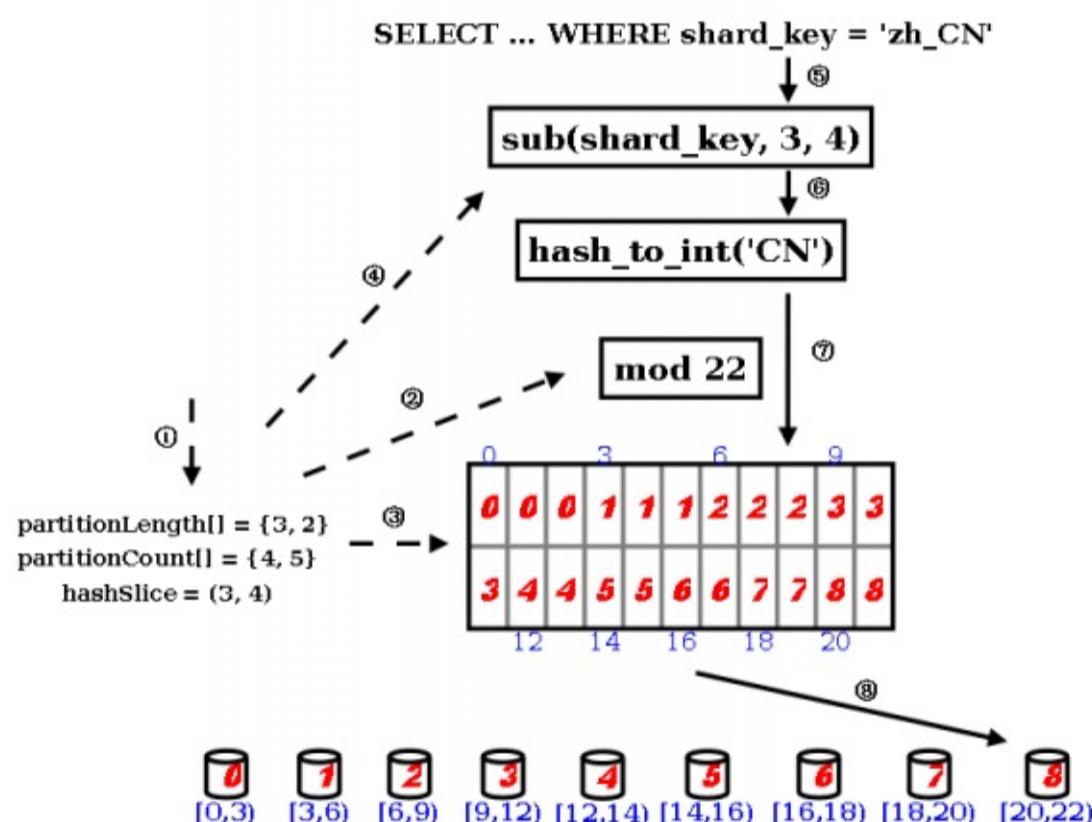
3.

|            |          | <b>hash</b> |
|------------|----------|-------------|
| $l < r$    | $[l, r)$ | hash        |
| $l \geq r$ |          | 0           |

hash hashhashhash

- ## 1. hash(3)

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>
```

&lt;/function&gt;

**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

...

**schemaX**dbledble

**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

**type**ehcache

factory.encache=ehcache

factory.leveldb=leveldb

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

pool.ER\_SQL2PARENTID=**leveldb,1000,1800**

**type**encacheleveldb

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**

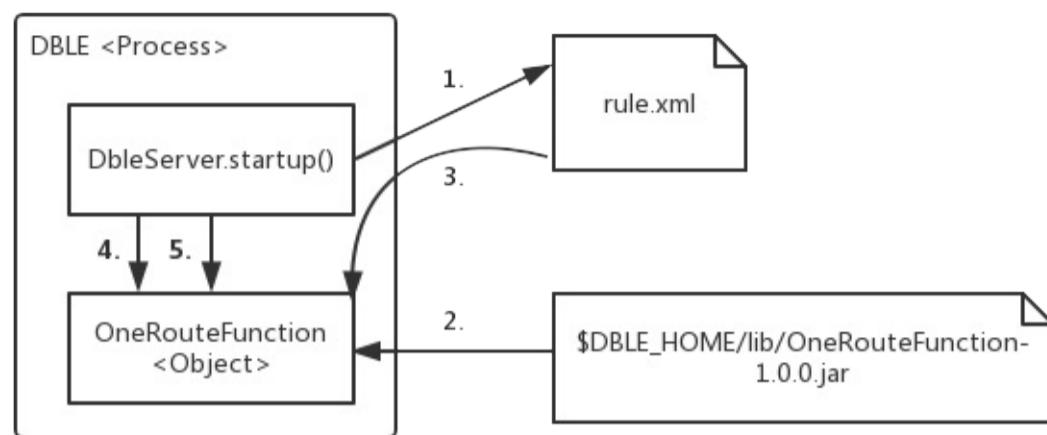
4.dbledefaultCachecache

## 1.9

### 1.9.1

#### 1.9.1.1

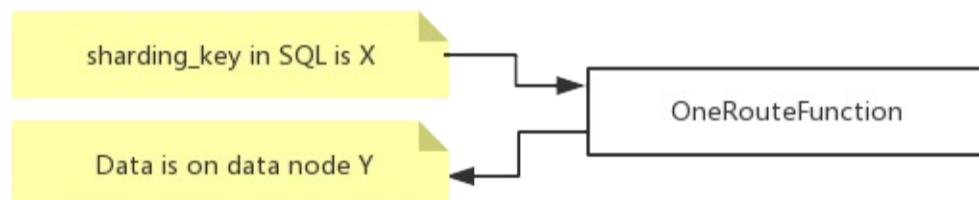
dble



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

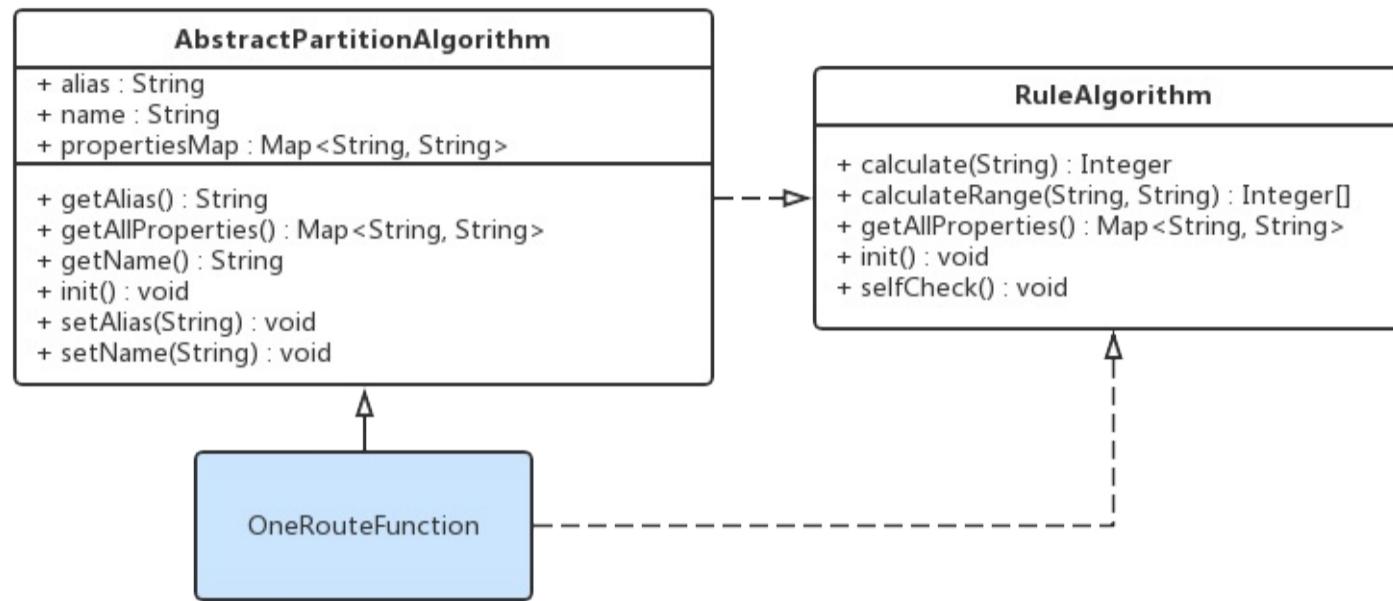
jar classlibraryjarclass

## 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             |

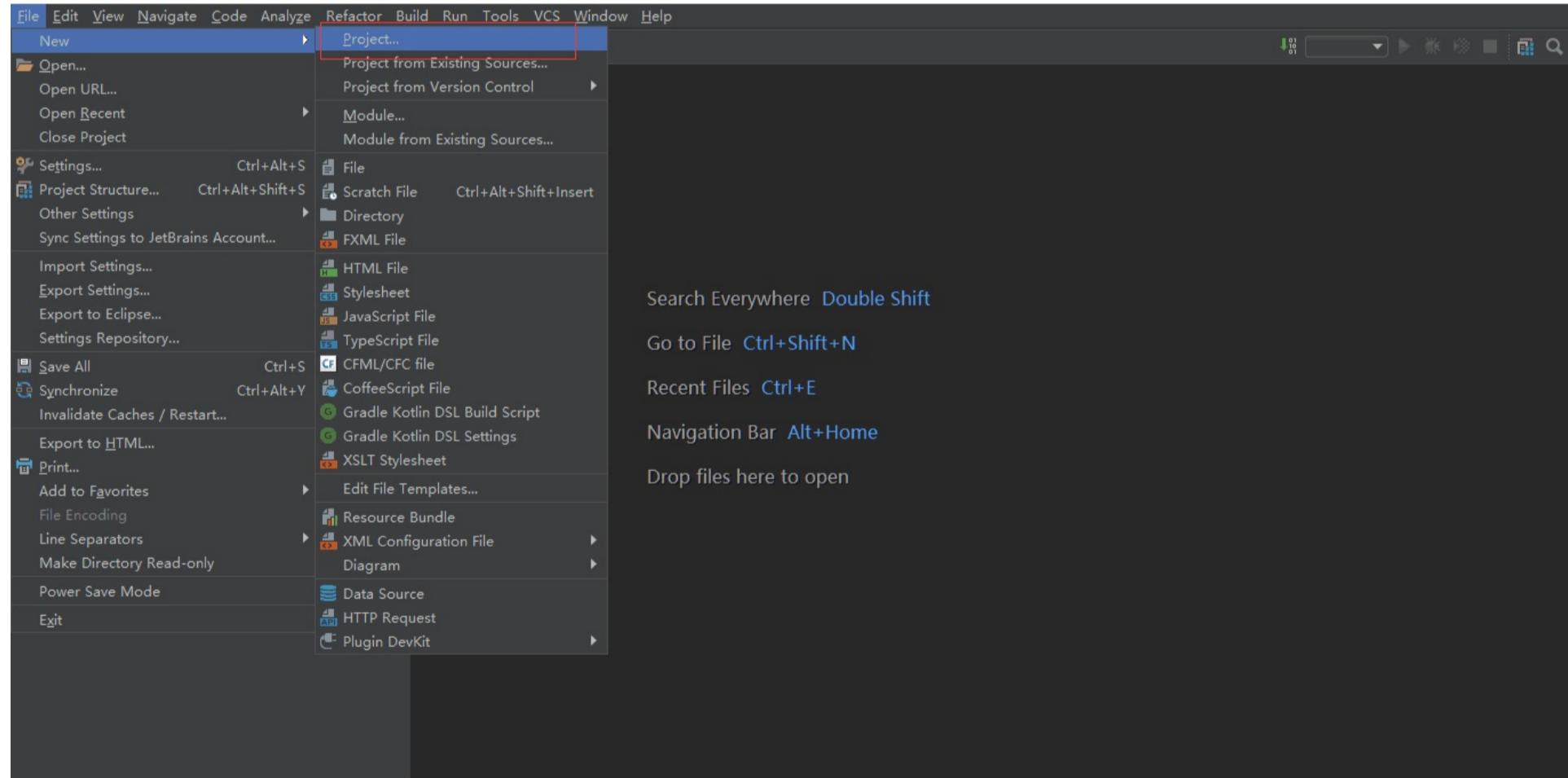
## 1.9.5 IntelliJ IDEA

### 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

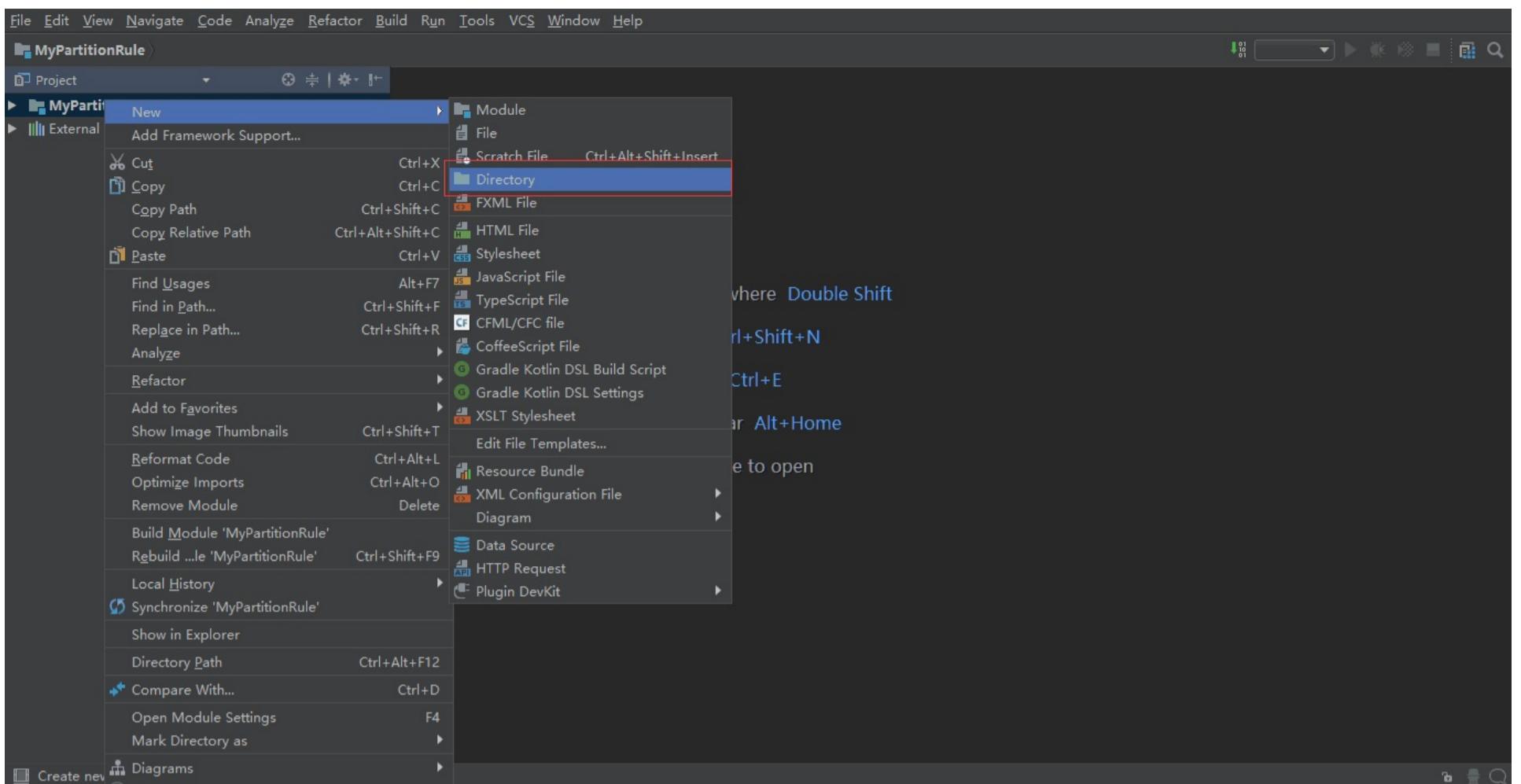
javaProject



Projectjavanext

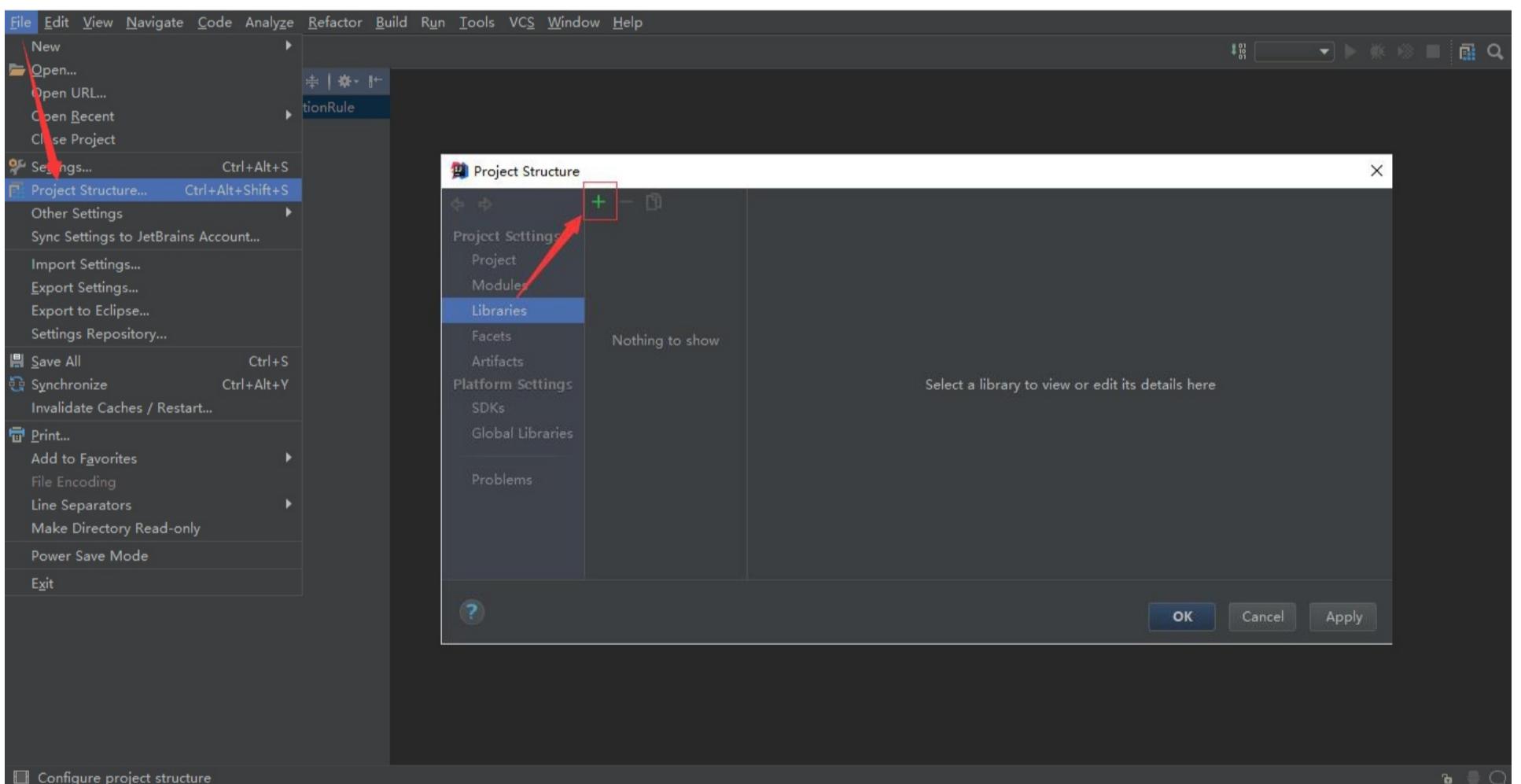
### 1.9.5.2 dble jar

javalib



double jarlib

libdble jar

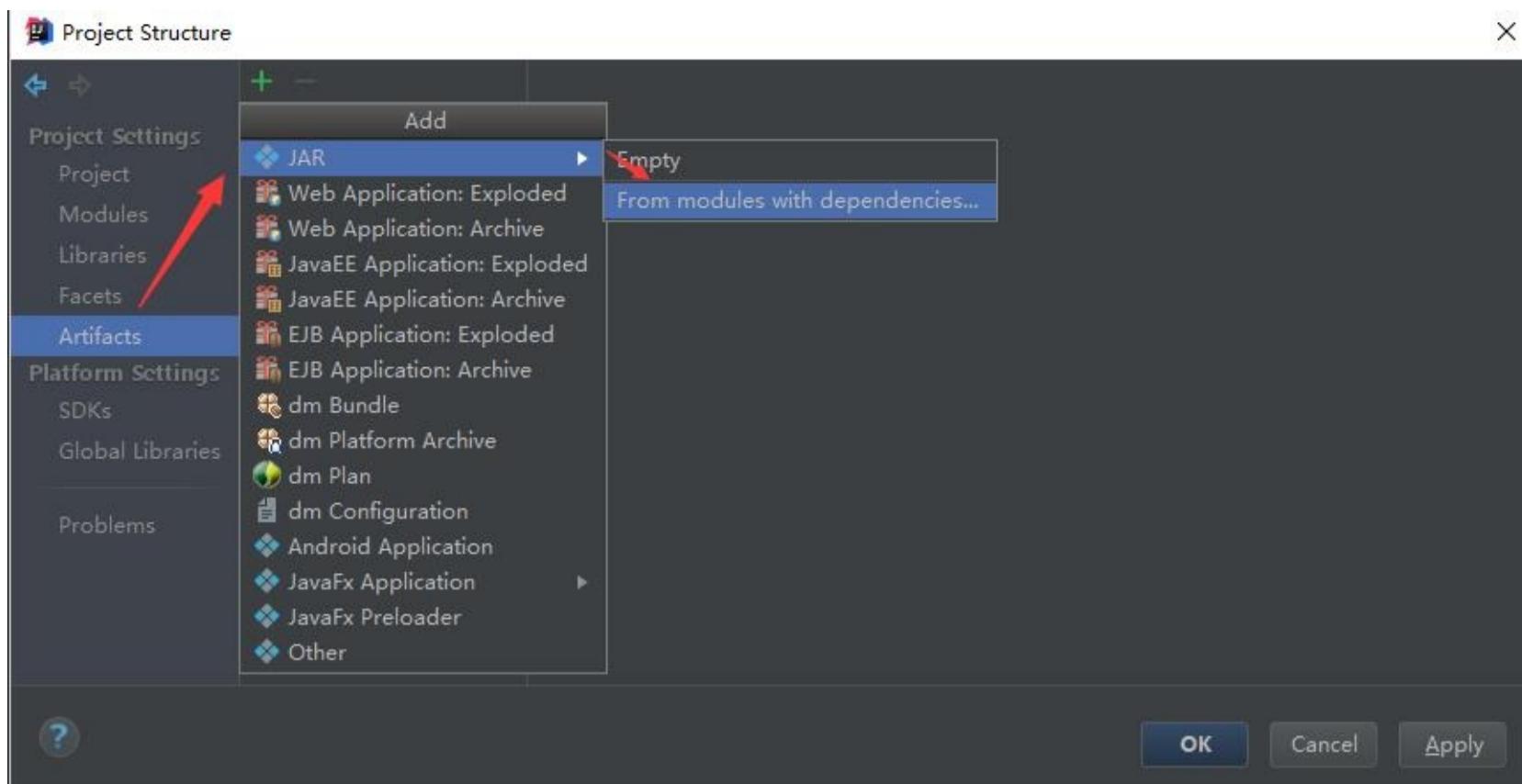


lib

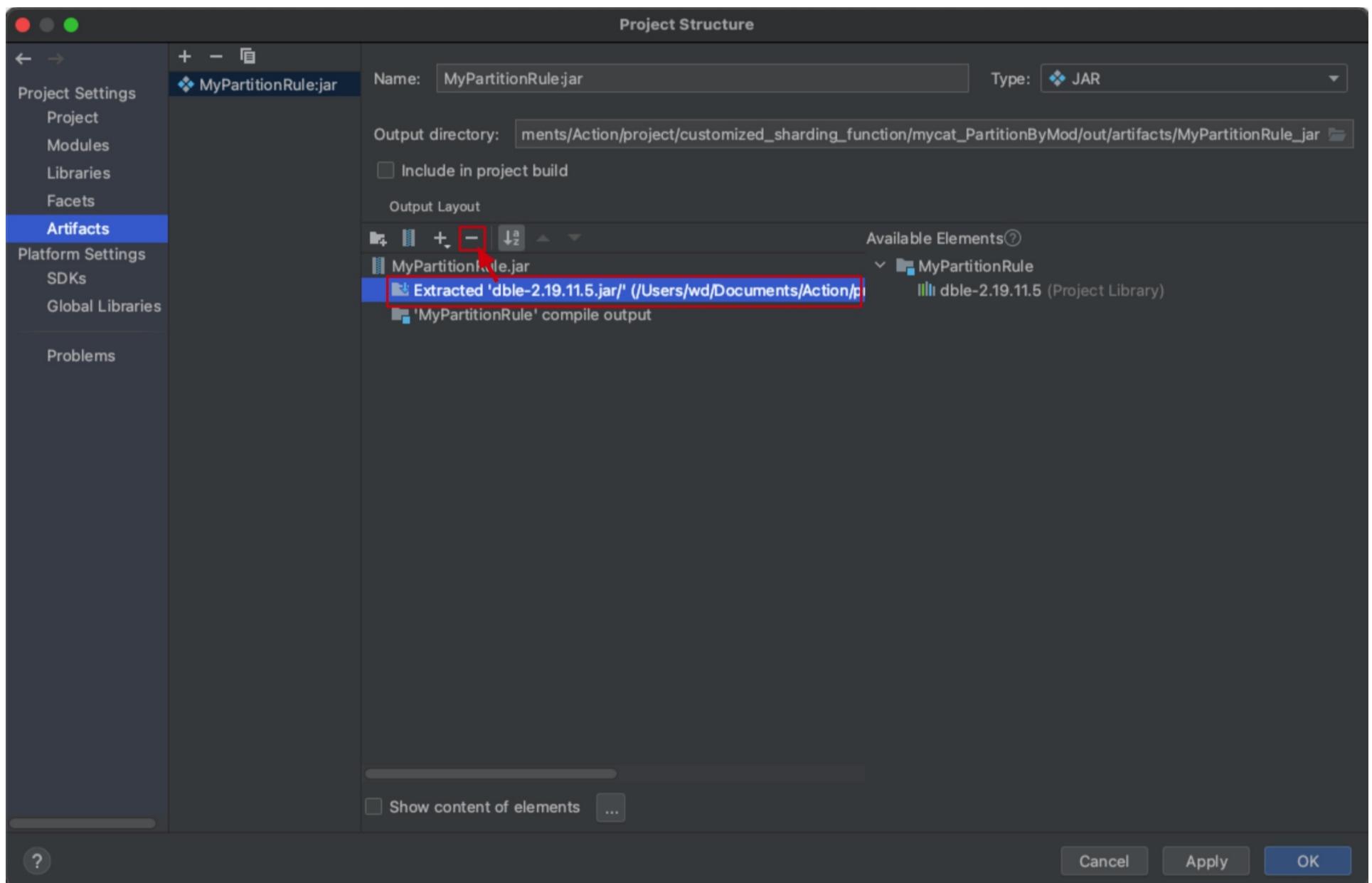
### 1.9.5.3

#### 1.9.5.4 Artifacts

Project StructureArtifactsOK

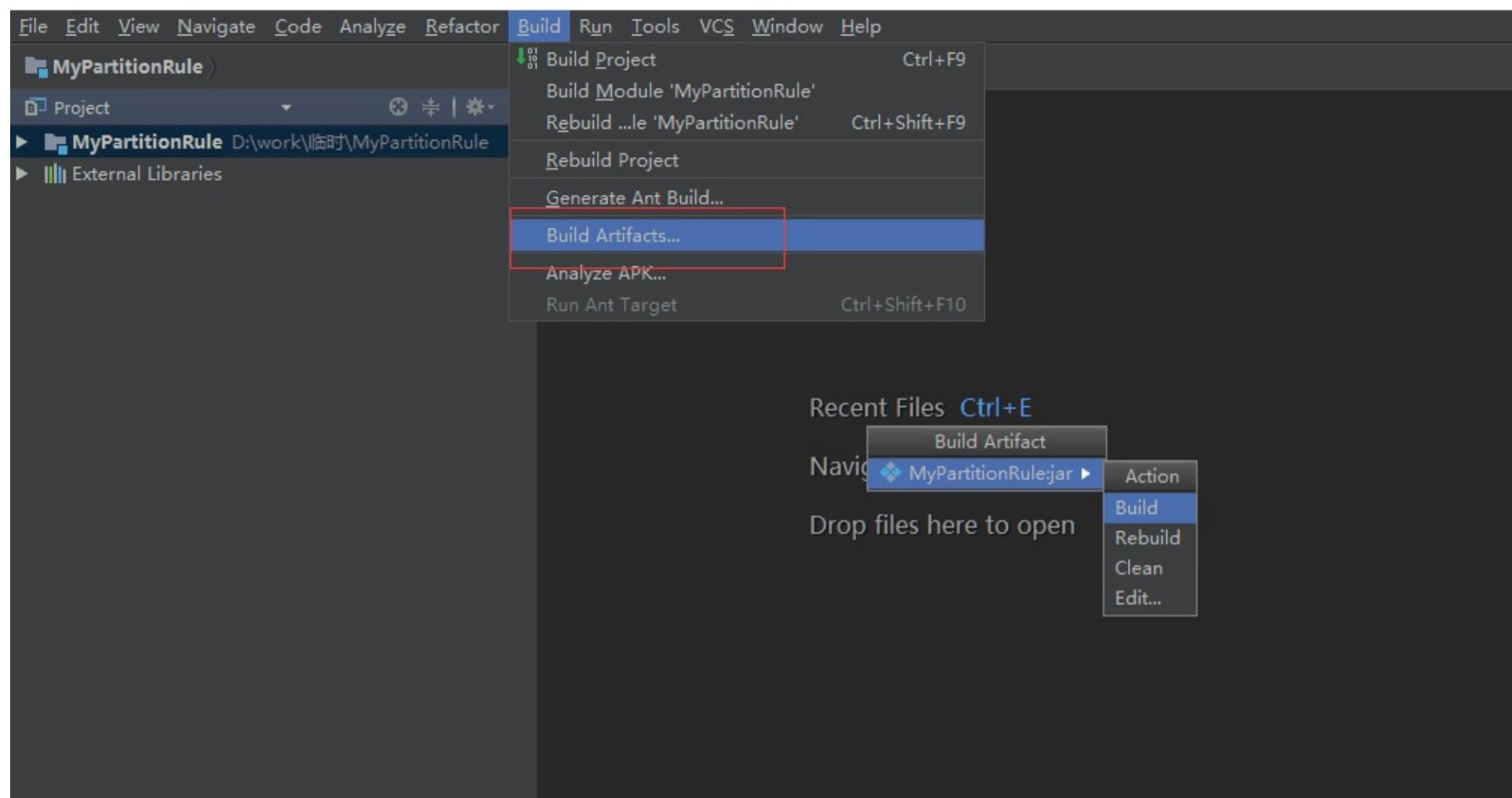


### 1.9.5.5 Artifactsdble jardble jarApply/ok



### 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

|  |                                  |                |  |  |
|--|----------------------------------|----------------|--|--|
|  |                                  |                |  |  |
|  | <b>useSqlStat</b>                | <b>3.23.08</b> |  | <b>useSqlStat=0<br/>samplingRate=0<br/>useSqlStat=1<br/>samplingRate=100</b> |
|  | <b>bufferUsagePercent</b>        | <b>3.23.08</b> |  | <b>80%sqluseSqlStat=1</b>  |
|  | <b>clearBigSQLResultSetMapMs</b> | <b>3.23.08</b> |  | <b>sqluseSqlStat=1<br/>bufferUsagePercent</b>                                |
|  | <b>sqlRecordCount</b>            | <b>3.23.08</b> |  | <b>show @@sql.slow<br/>useSqlStat=1</b>                                      |
|  | <b>samplingRate</b>              | <b>3.23.08</b> |  | <b>0100; 100%sqlsql_log</b>  |
|  | <b>enableStatisticAnalysis</b>   | <b>3.23.08</b> |  | <b>show @@sql.sum.usershow<br/>@@sql.sum.tablesshow<br/>@@sql.condition</b>  |

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

|  |                       |         |  |  |
|--|-----------------------|---------|--|--|
|  |                       |         |  |  |
|  | <b>delayThreshold</b> | 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

|  |  |         |  |
|--|--|---------|--|
|  |  |         |  |
|  | <b>inSubQueryTransformToJoininjoin</b> | 3.21.06 |  |
|  | <b>enableCursor false</b>              | 3.21.06 |  |

inSubQueryTransformToJoin

sqljoinbleinjoin  
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

|  |                 |                |   |
|--|-----------------|----------------|---|
|  |                 |                |   |
|  | <b>homePath</b> | <b>3.21.02</b> | <b>bootstrap.cnf</b><br><b>homePath=DhomePath=.</b> |

#### 3.20.07.0

1

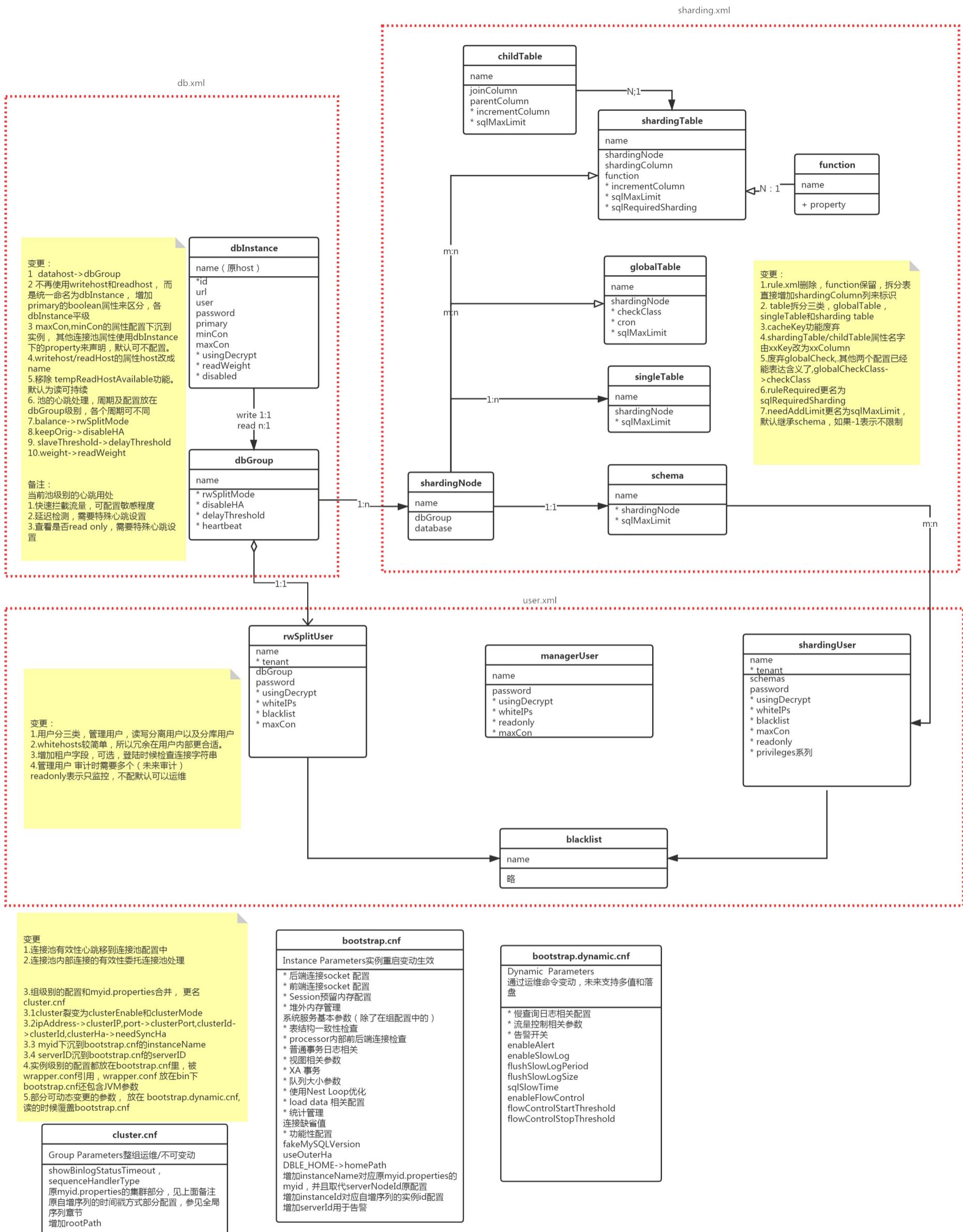
dble 3.20.07.0 [2.20.04.0](#)

[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)
```

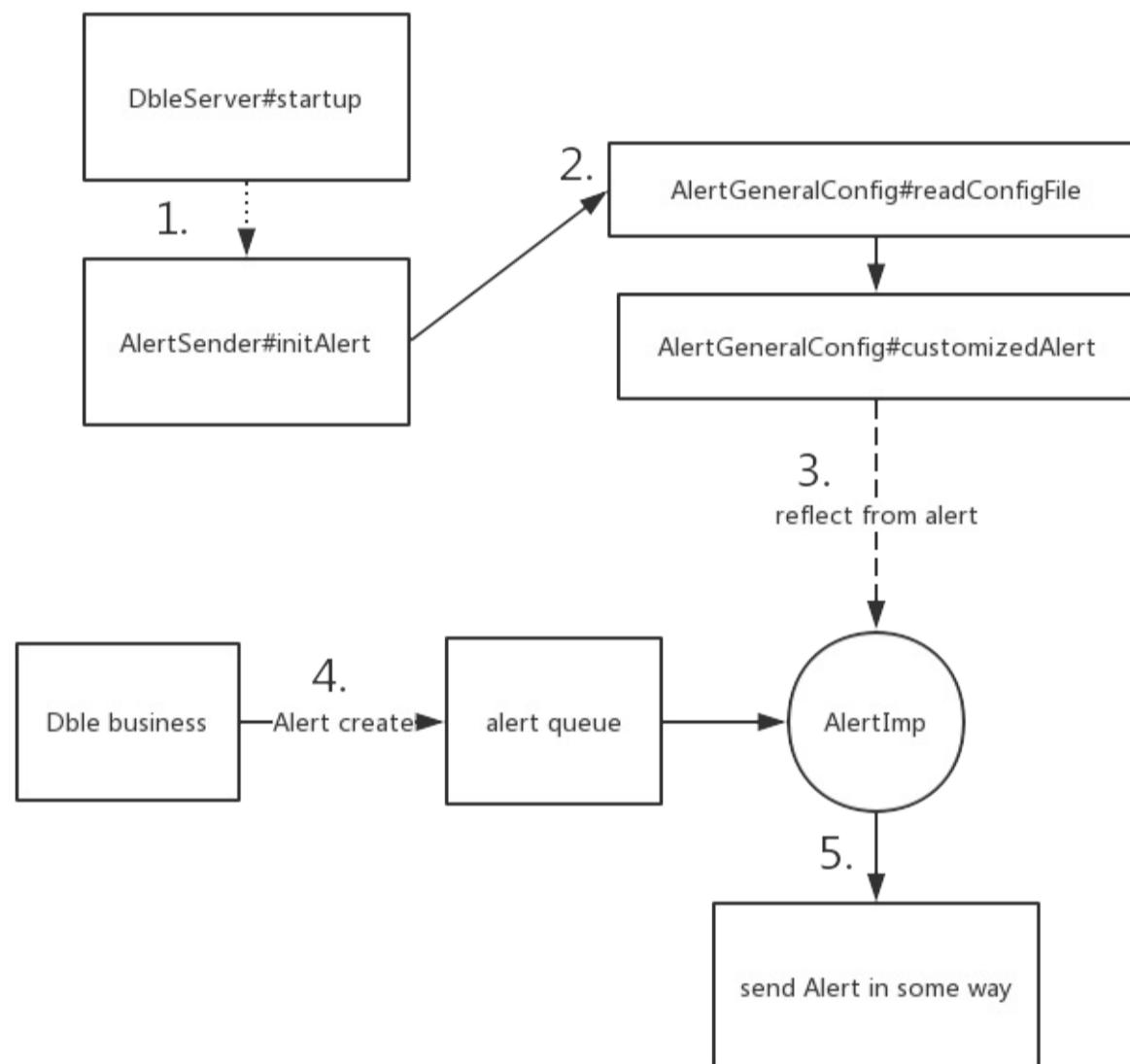


## 1.11

- - 
  - 
  - 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

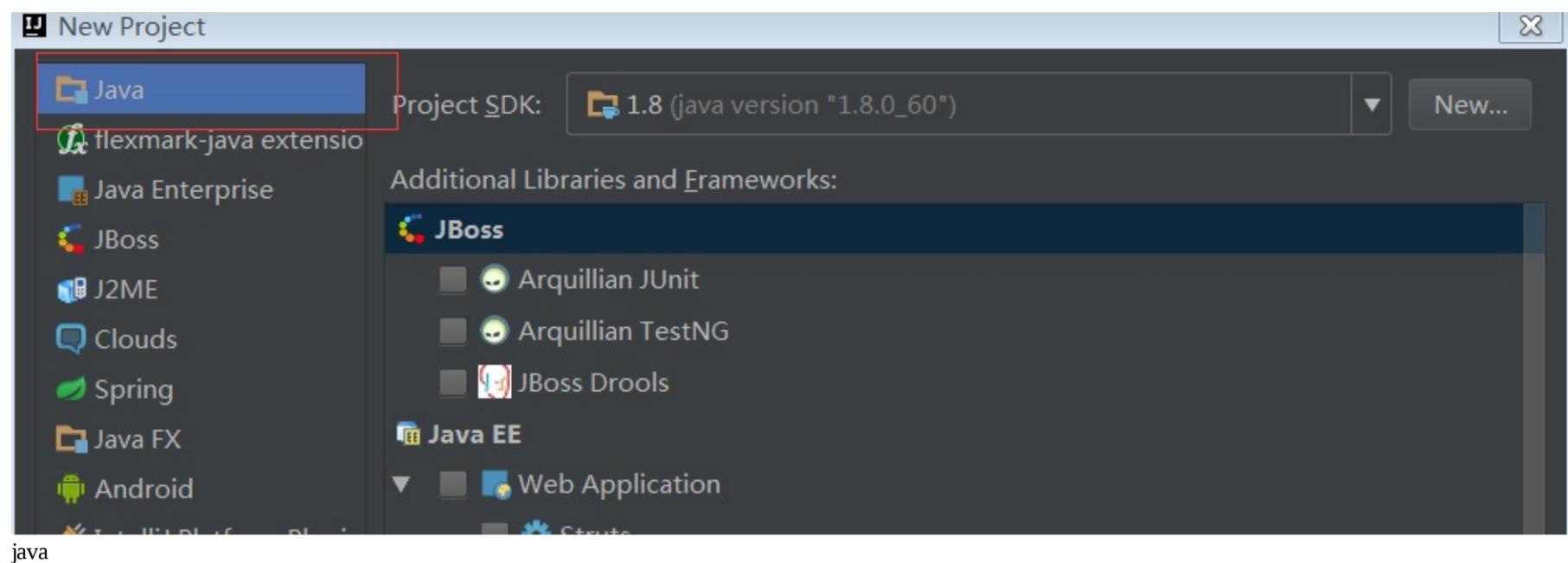
dbledble

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

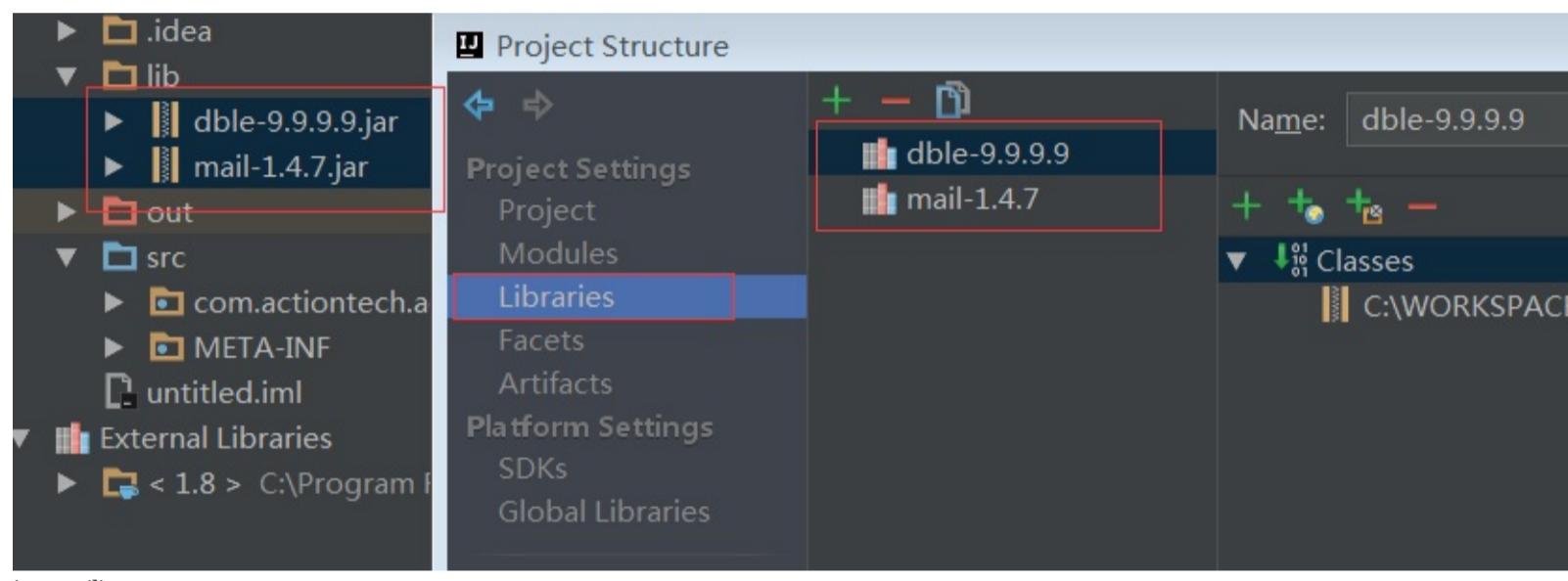
dble ----- Alert

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\_SENTERSENDER\_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);
}

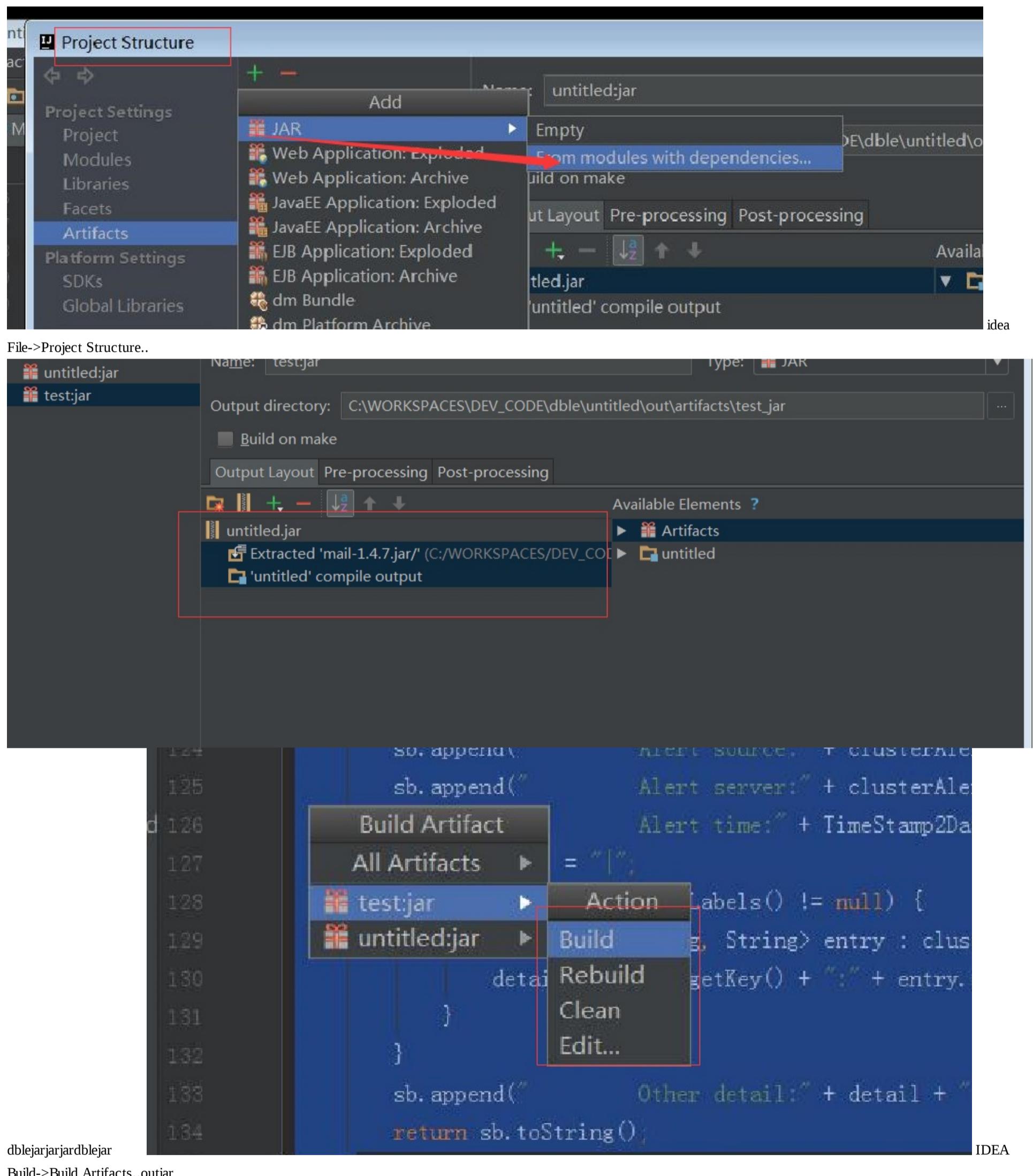
```

```

@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](#)

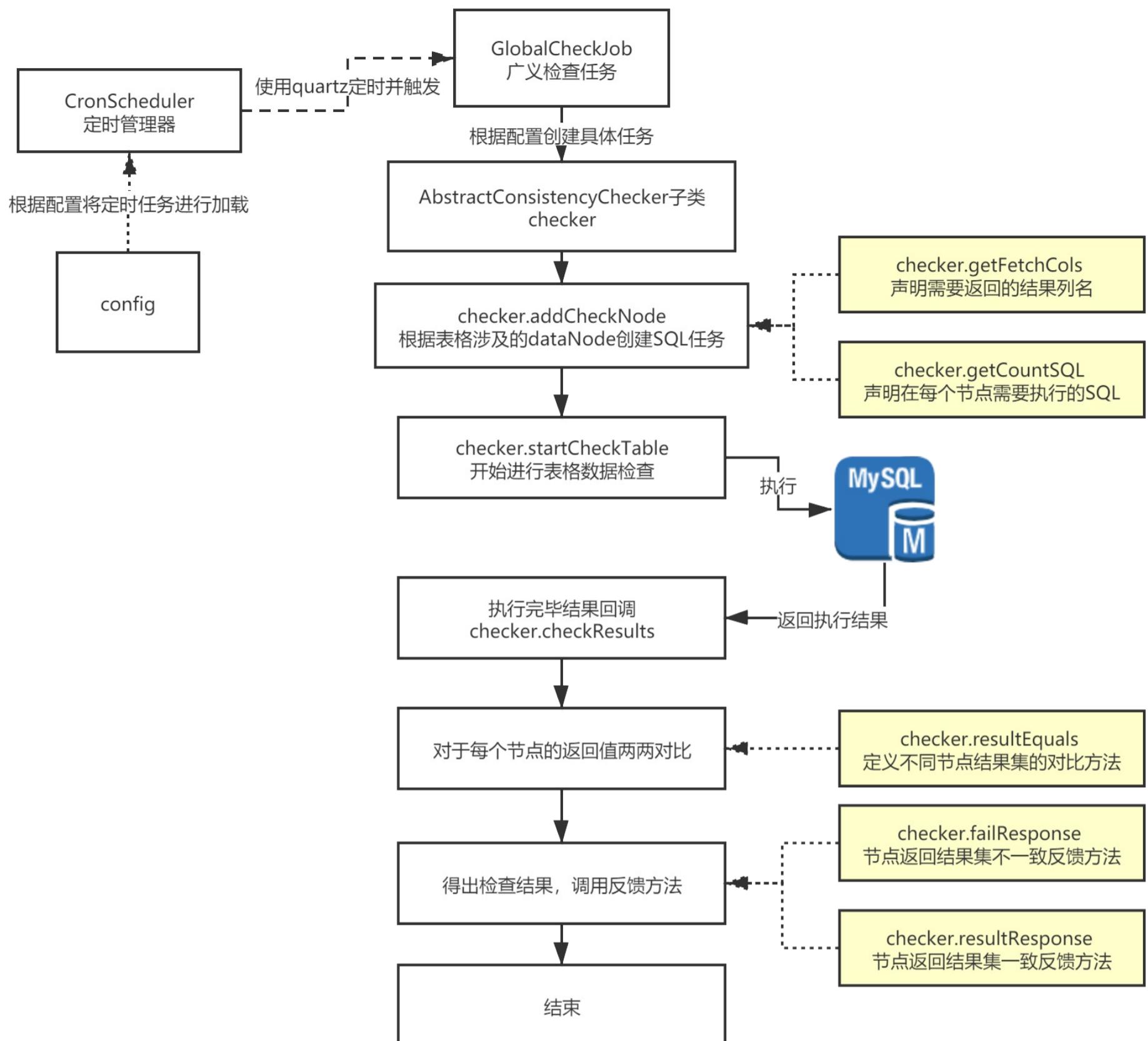
## 1.11.3 dbleCODE

|   |                          |   |
|---|--------------------------|---|
|   |                          |   |
| 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)

//

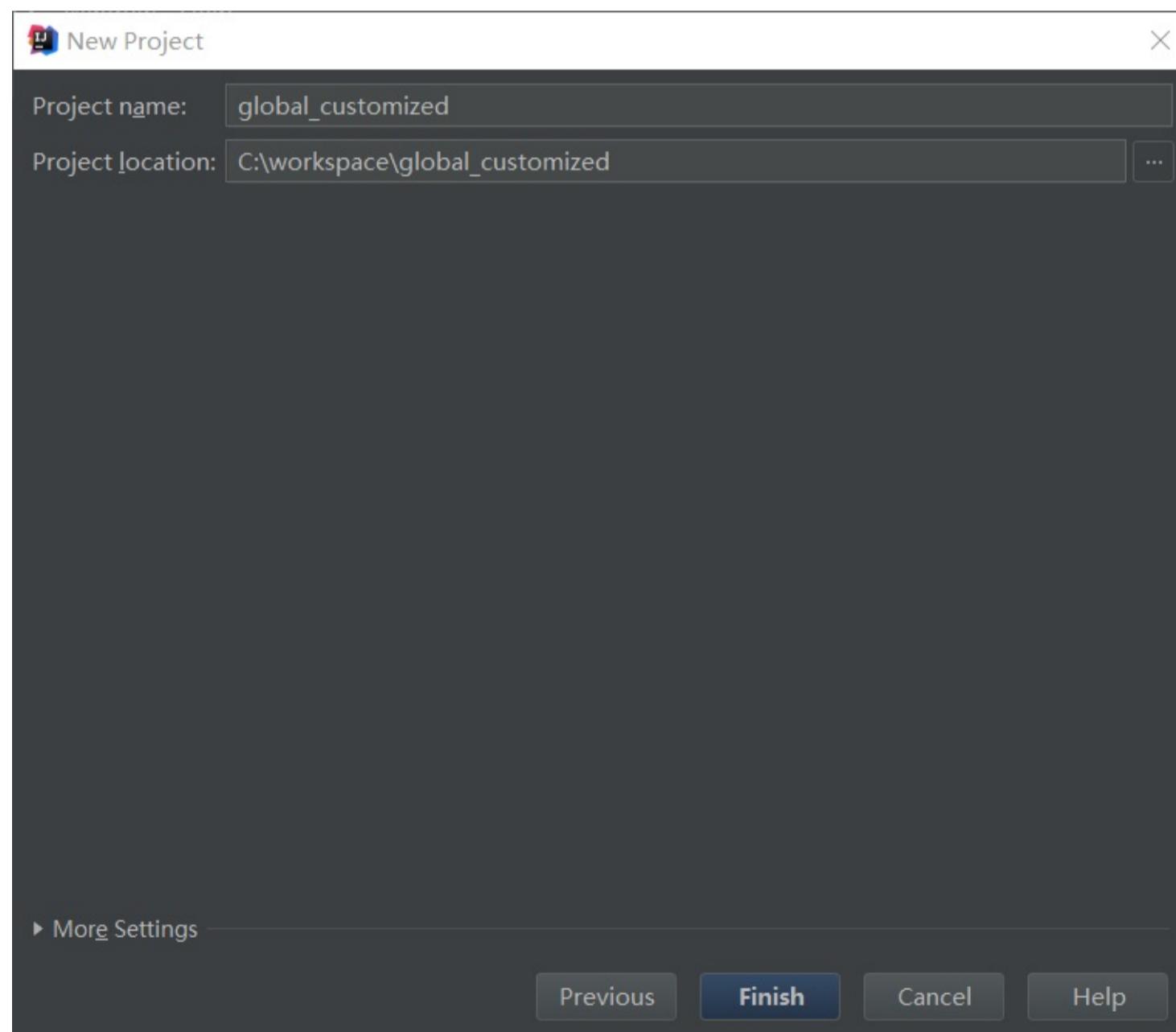
```
public void failResponse(List<SQLQueryResult<List<Map<String, String>>>> res) {
    //
    /////
    String errorMsg = "Global Consistency Check fail for table :" + schema + "-" + tableName;
    System.out.println(errorMsg);
    for (SQLQueryResult<List<Map<String, String>>> r : res) {
        System.out.println("Checksum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

## 5. void resultResponse(errorList)

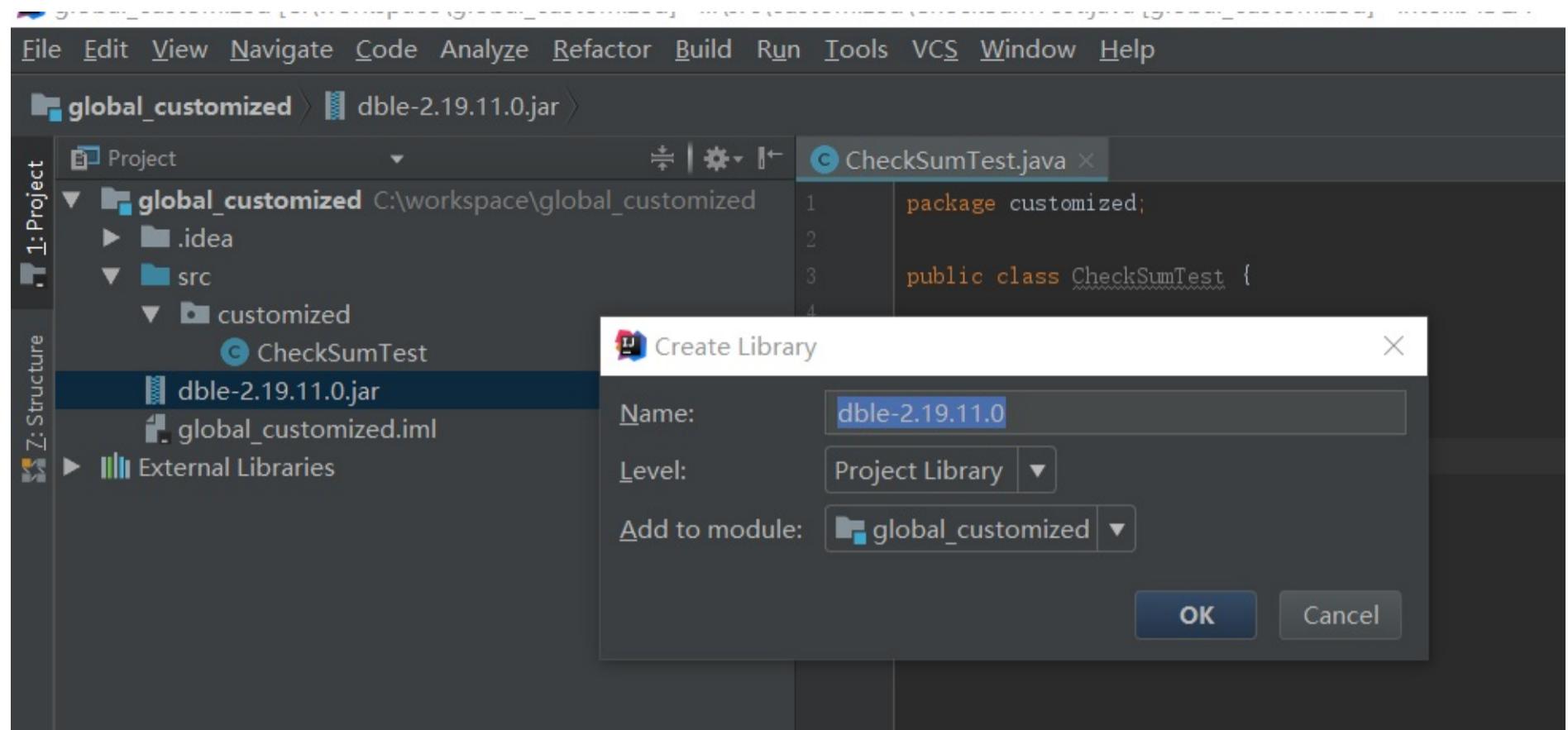
```
//  
0
```

```
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

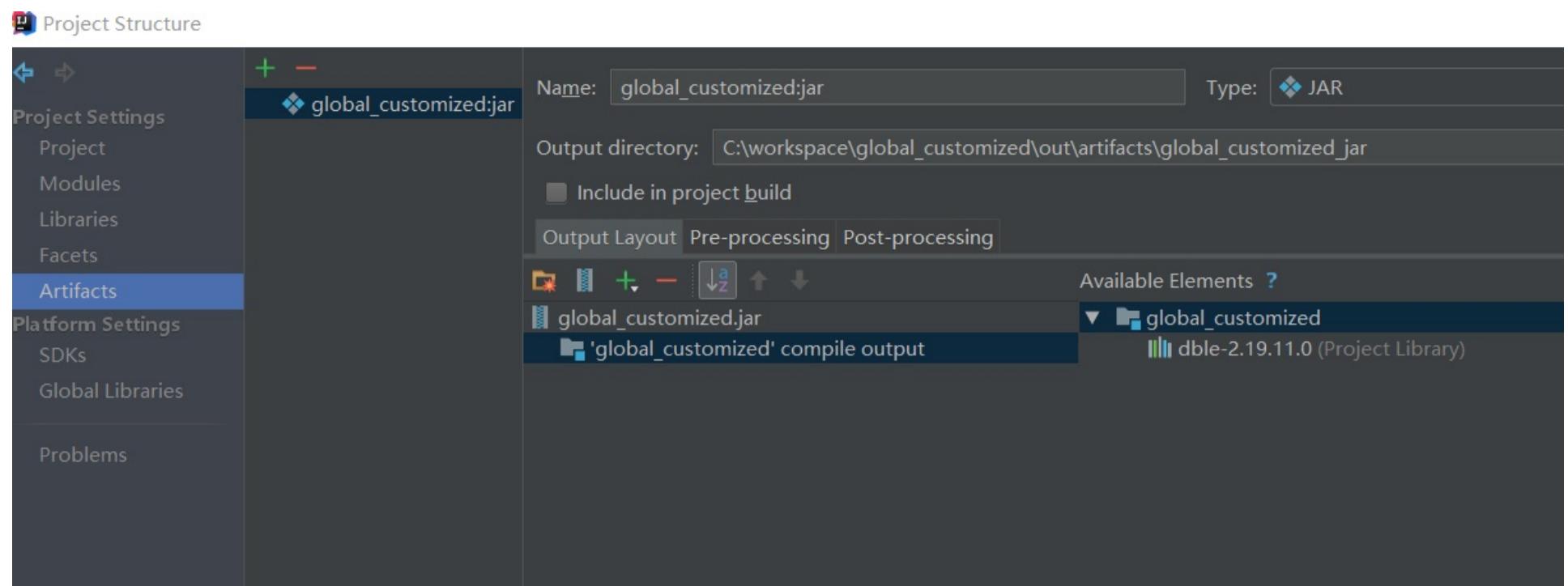
```

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<br>reload_matadata/reload_all/manager_insert/manager_update/mamager_delete |
| reload_status     |      | reload<br>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 |
|-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | show databases      | show databases       | Show     | 1 | 3 | test | 127.0.0.1 | 8066 |
| 2 | show tables         | show tables          | Show     | 2 | 3 | test | 127.0.0.1 | 8066 |
| 3 | select @@version_comment limit 1 | SELECT @@version_comment LIMIT ? | Select   | 3 | 3 | test | 127.0.0.1 | 8066 |
| 4 | show tables         | show tables          | Show     | 4 | 3 | test | 127.0.0.1 | 8066 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
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 digestsql |
| 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`.`CUSTOMER`": "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`.`CUSTOMER`": "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](#)
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- [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' mysqldble

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)
```

**2.1.15.10**slowQueueOverflowPolicy`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<br>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. dbledbGroupdbGroupprwSplitUserdbGroupdb.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

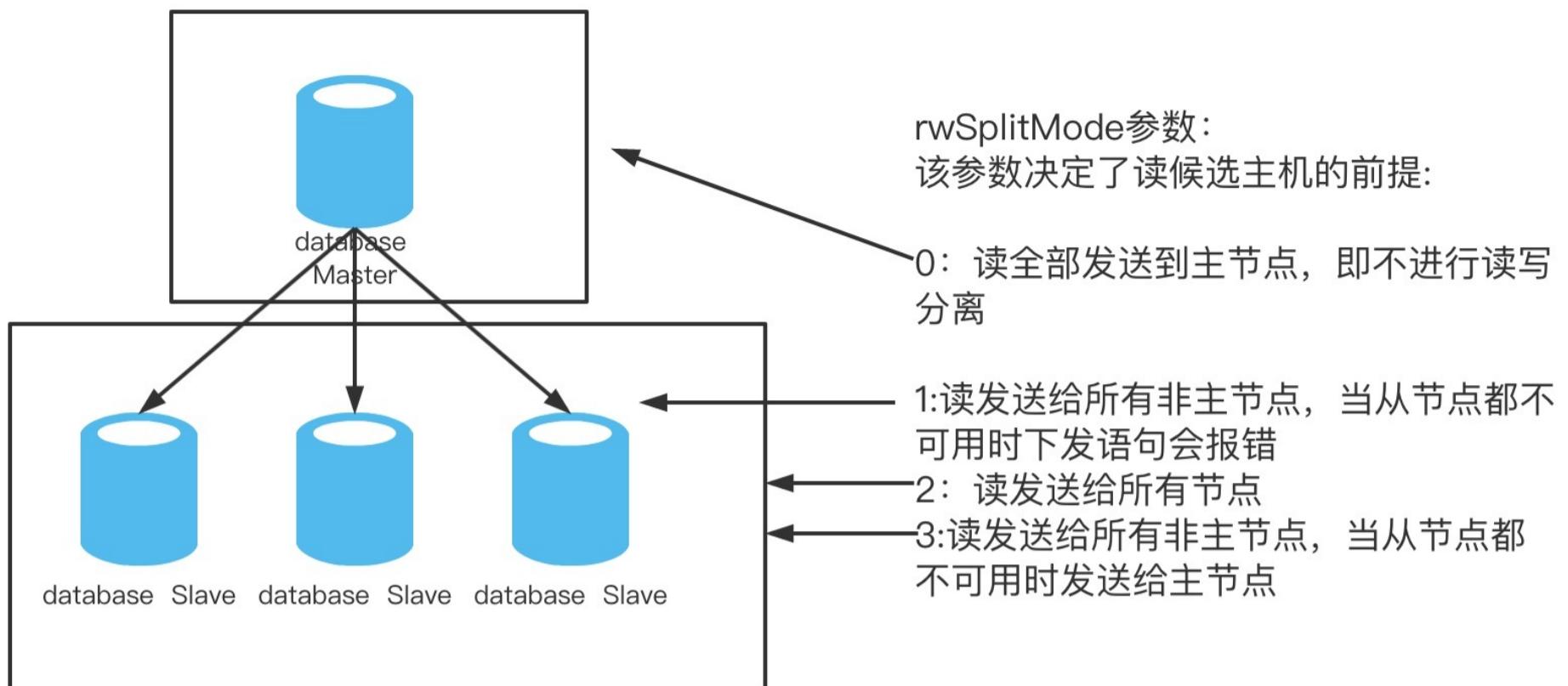
- (primary="true")
  - rwSplitMod2dbInstances
  - (primary primary="false")
    - dbInstances
    - dbInstances
- -

#### 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
```

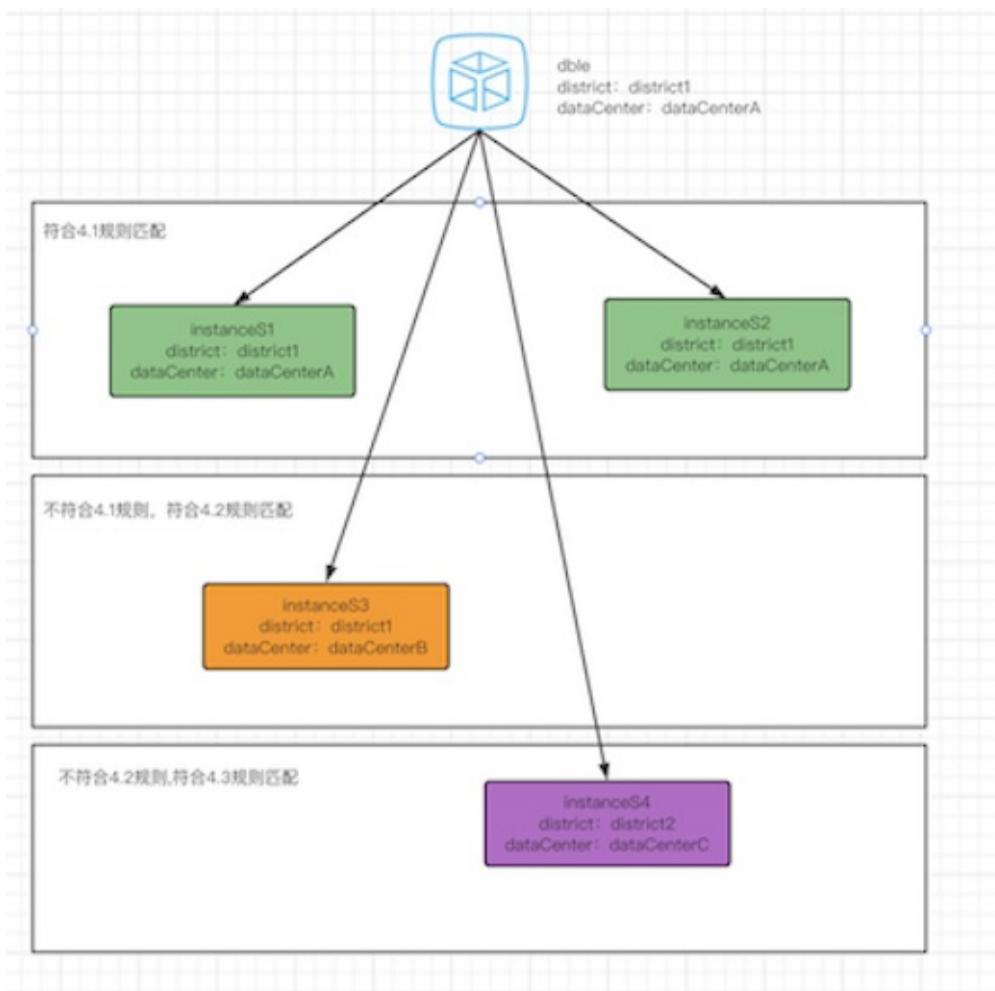
db.xml

```
<?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, ddlmysqlread\_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  
(

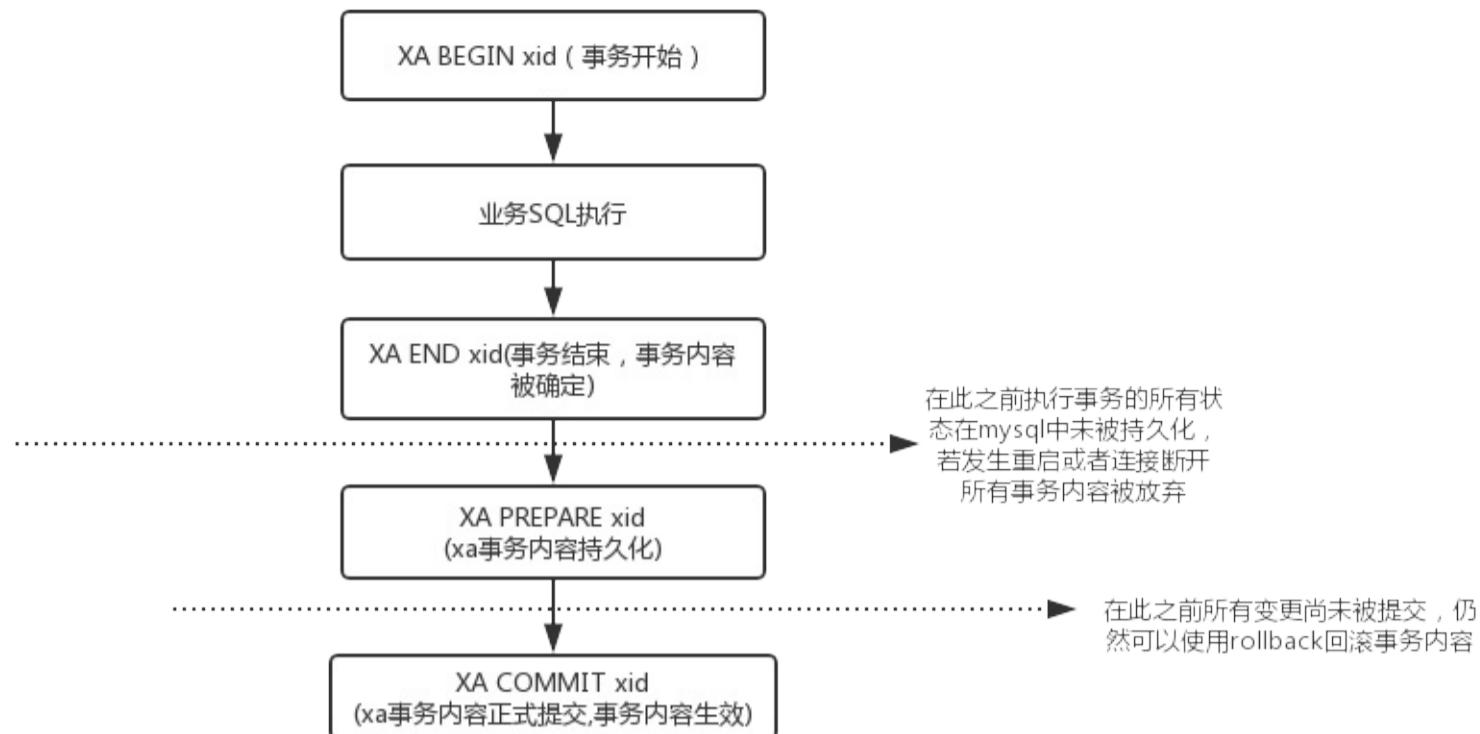
```
public class XaDemo {

    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

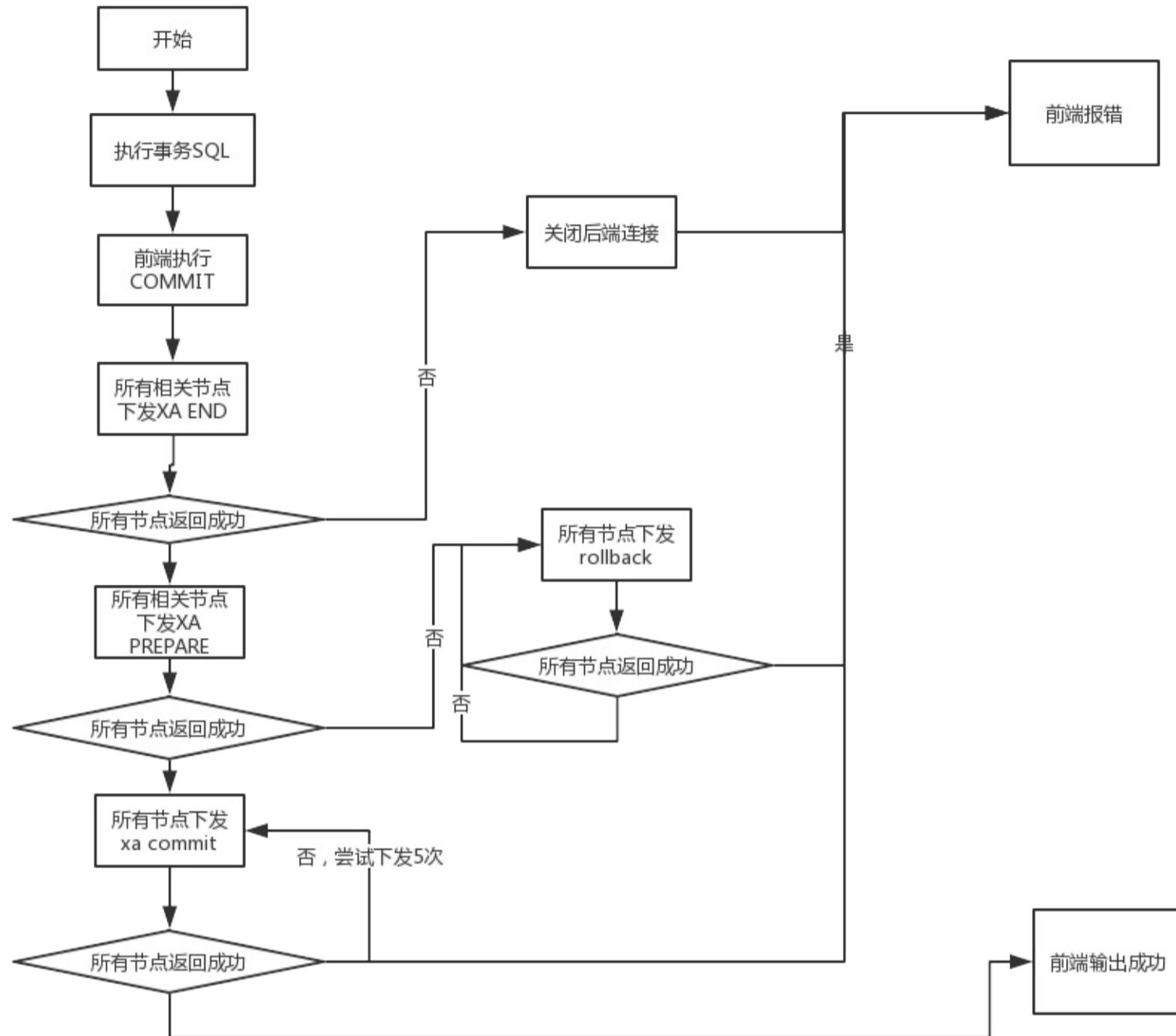
xamysql5.7xa



## 2.5.2 XA

### 2.5.2.1 XA

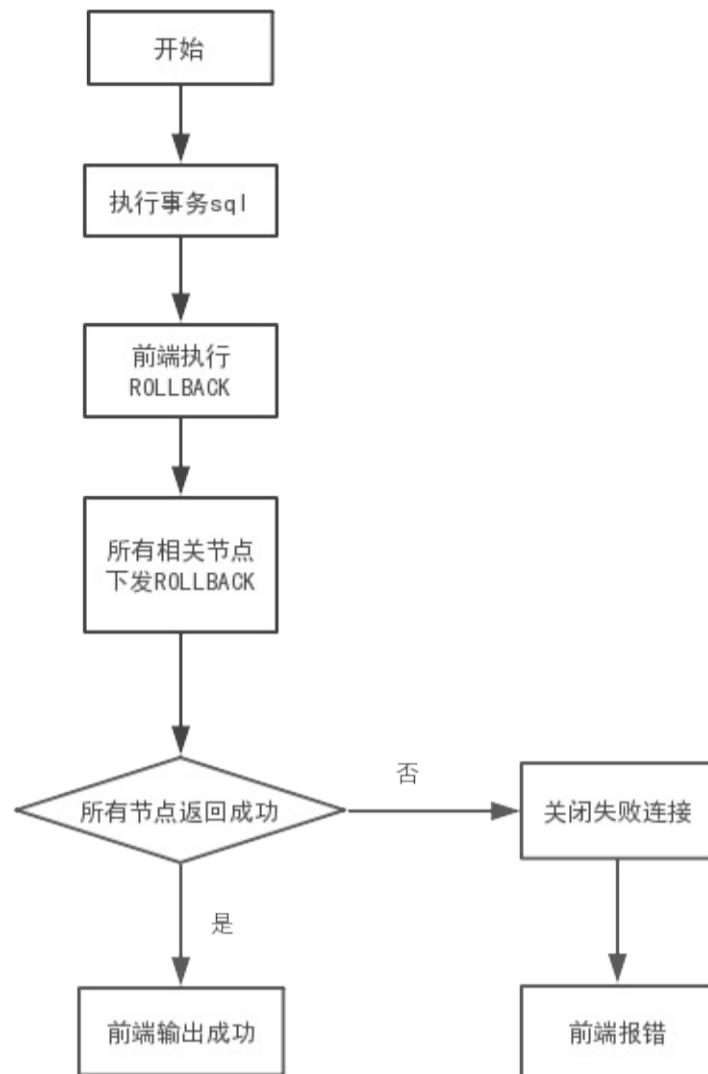
DbleXA



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 xa

1. xaRetryCount 0
2. xaRetryCount 0xaRetryCount

#### 2.5.2.3.2

2.19.03.0

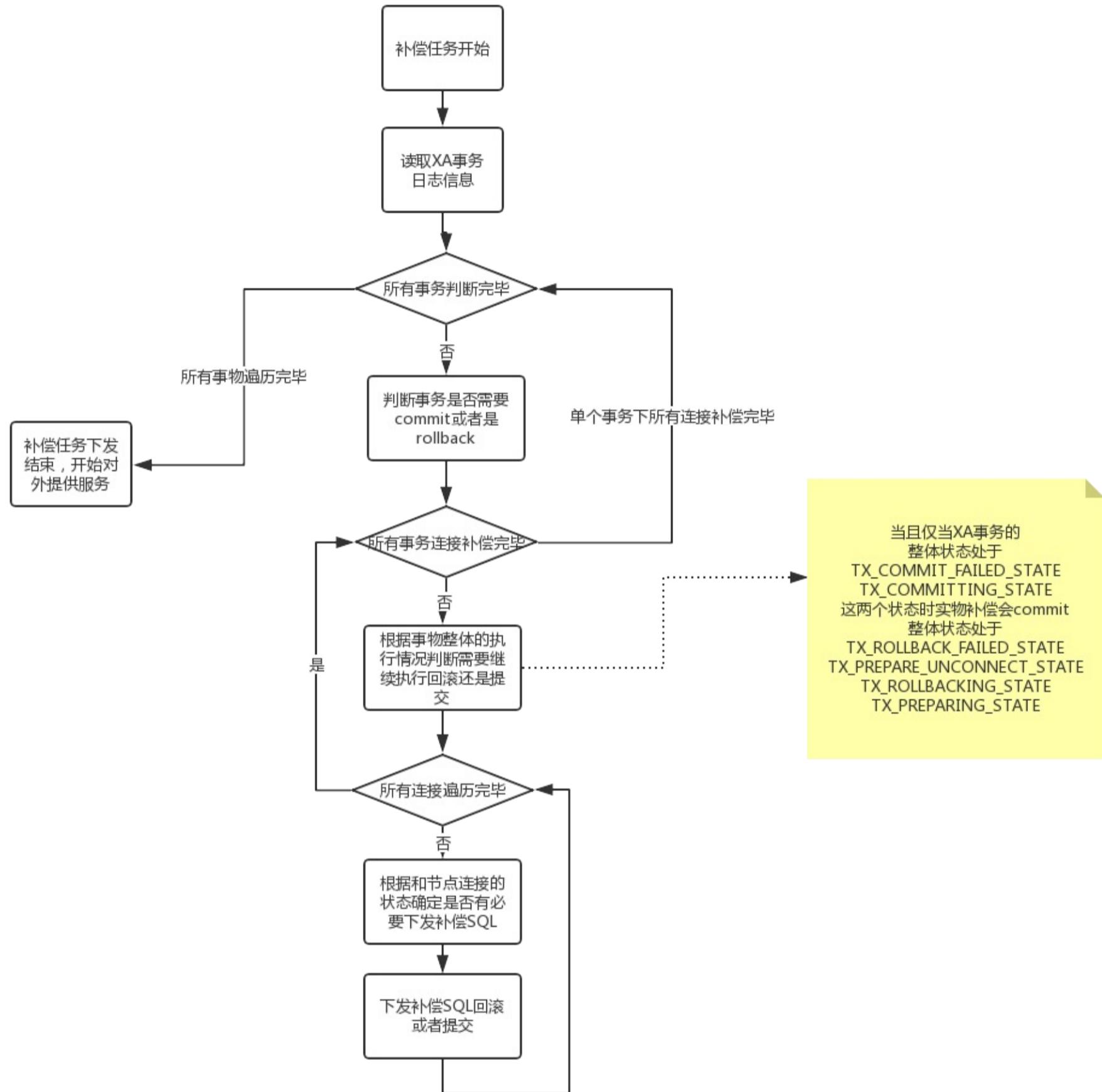
1. show @@session.xa xa
2. kill @@xa\_session id1,id2... sessionxa

#### 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

dblexec(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<br>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

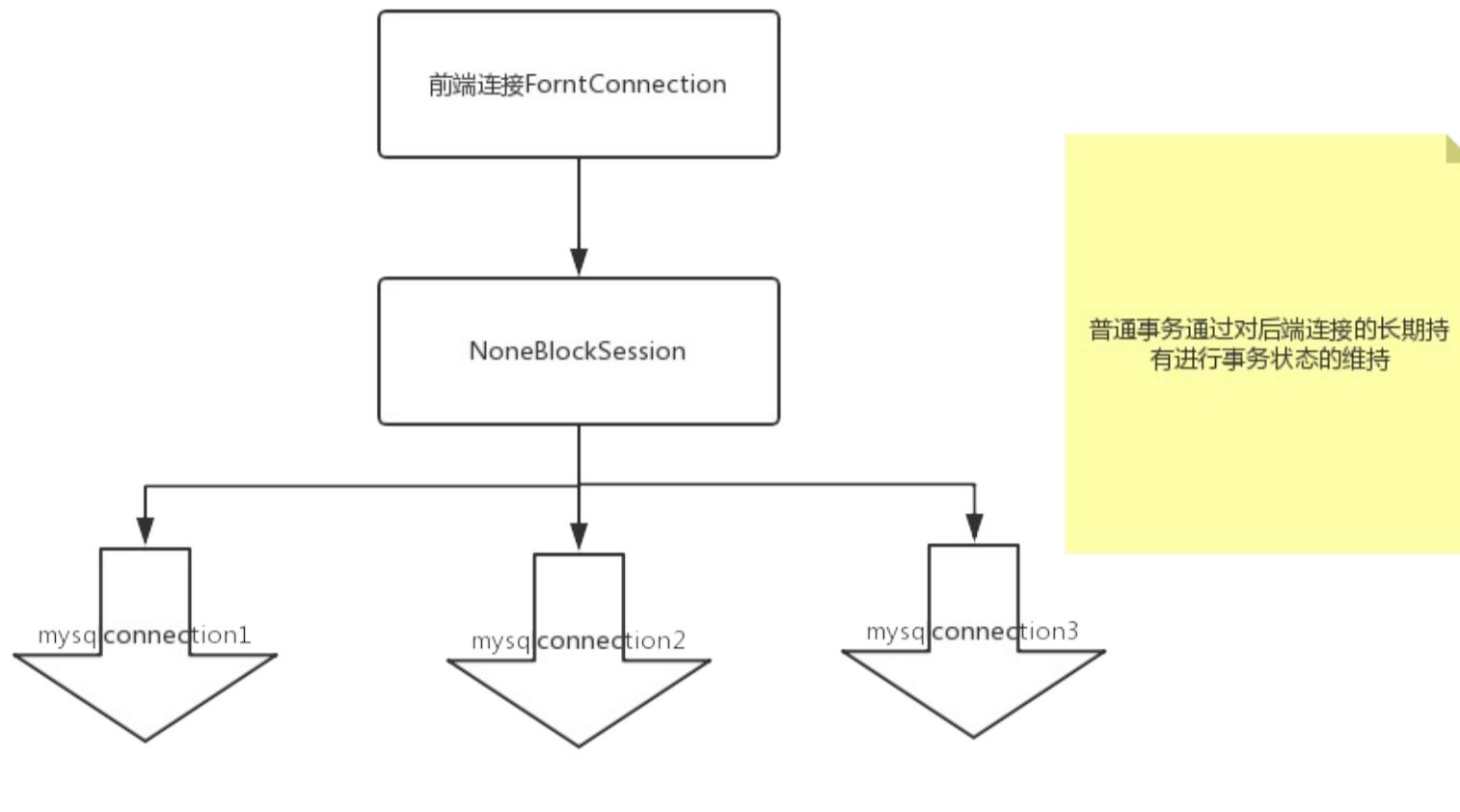
4Modifysql

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.

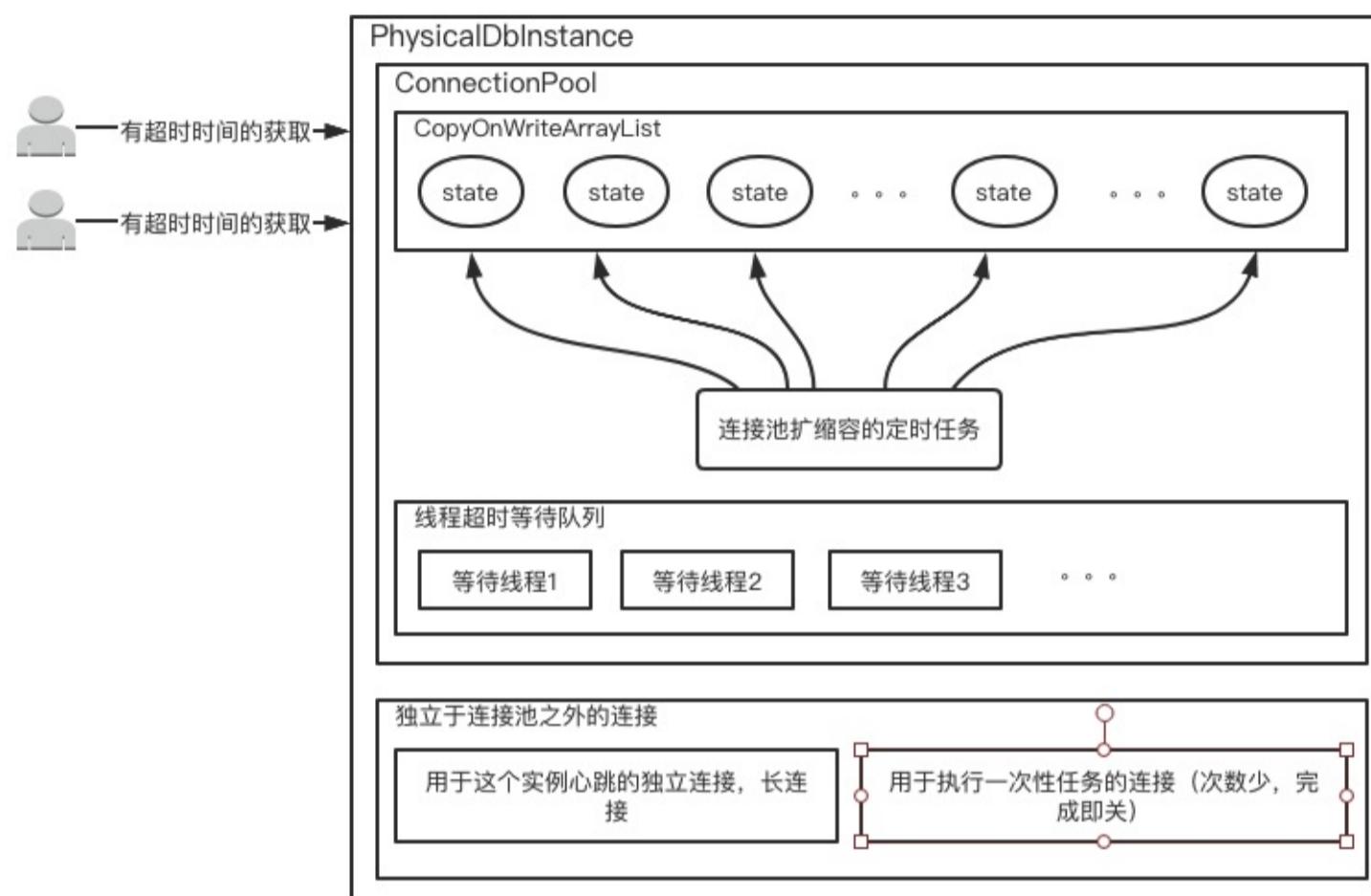
## 2.6

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

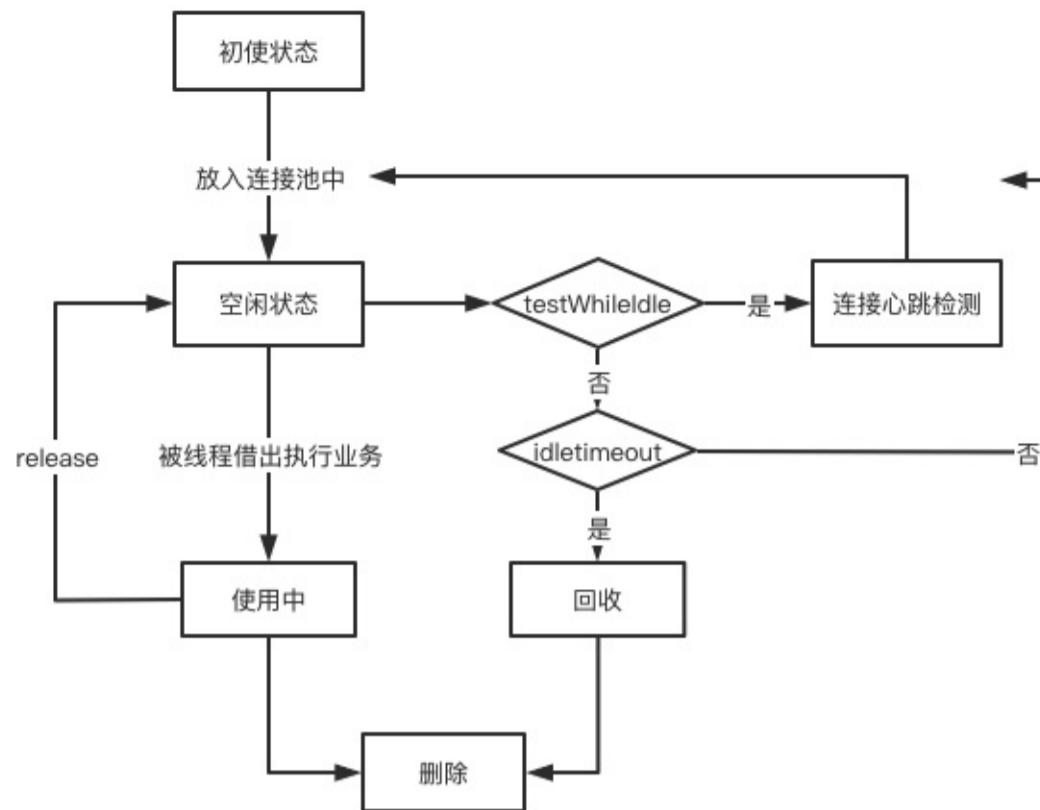
minCon minCon - > 0 && idleTimeout

#### 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

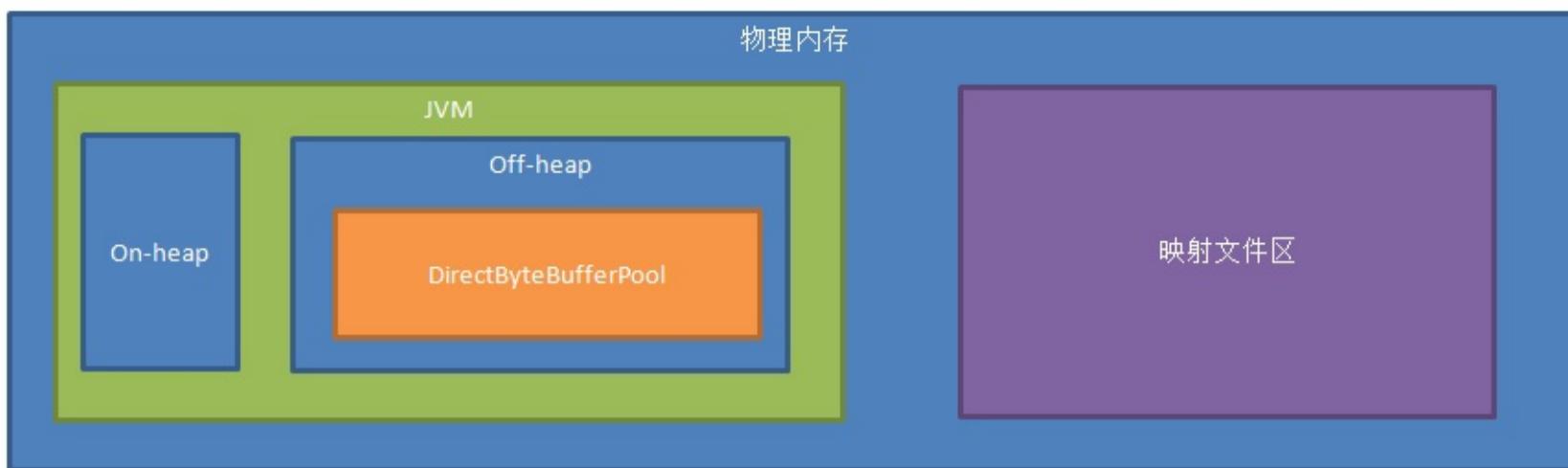
```
<dbGroup name="dbGroup1" rwSplitMode="1" delayThreshold="10000">
    <heartbeat errorRetryCount="1" timeout="10" keepAlive="60">show slave status</heartbeat>
    <dbInstance name="instanceM1" url="ip4:3306" user="your_user" password="your_psw" maxCon="200" minCon="50" primary="true">
    </dbInstance>
</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.instanceM1instanceM2mysqldbledbInstance

2.instanceM1instanceM2mysqlinstancem120050instanceM2100 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  
  

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

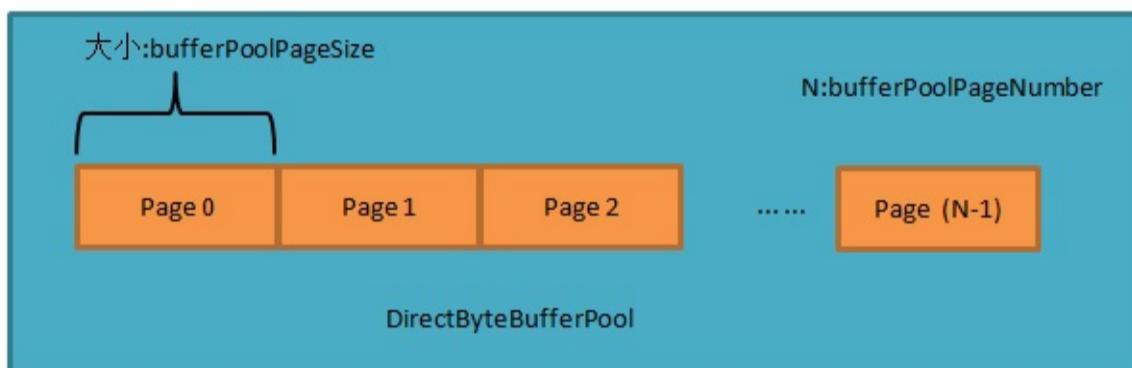
$$= ((\text{tmpMin}/\text{mappedFileSize}))$$

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

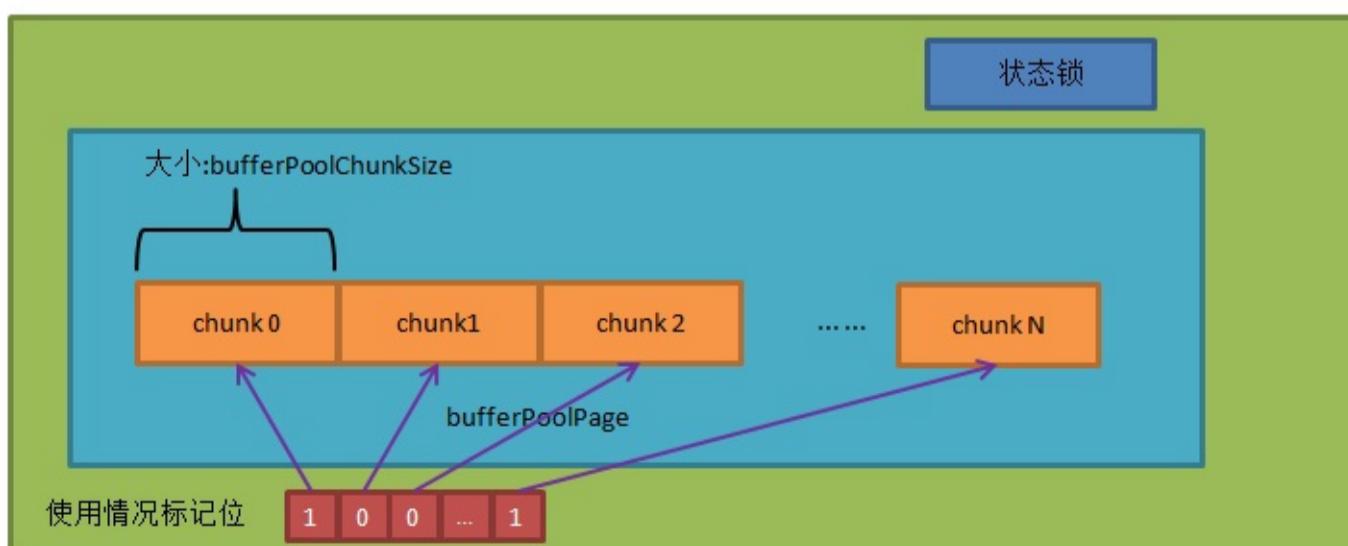
$$\text{mappedFileSizebootstrap.cnf}$$

### 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

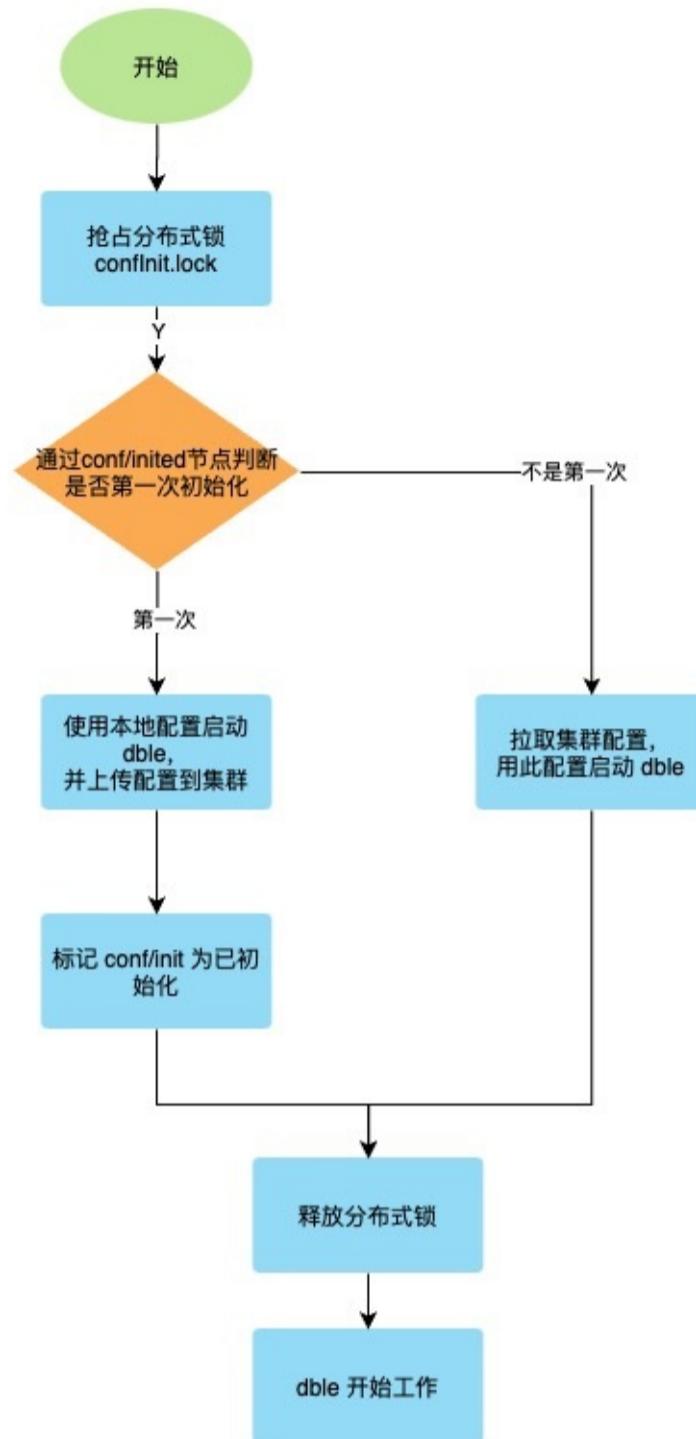
1.

init\_zk\_data.shZK,ZK

2.

ZK,ZK

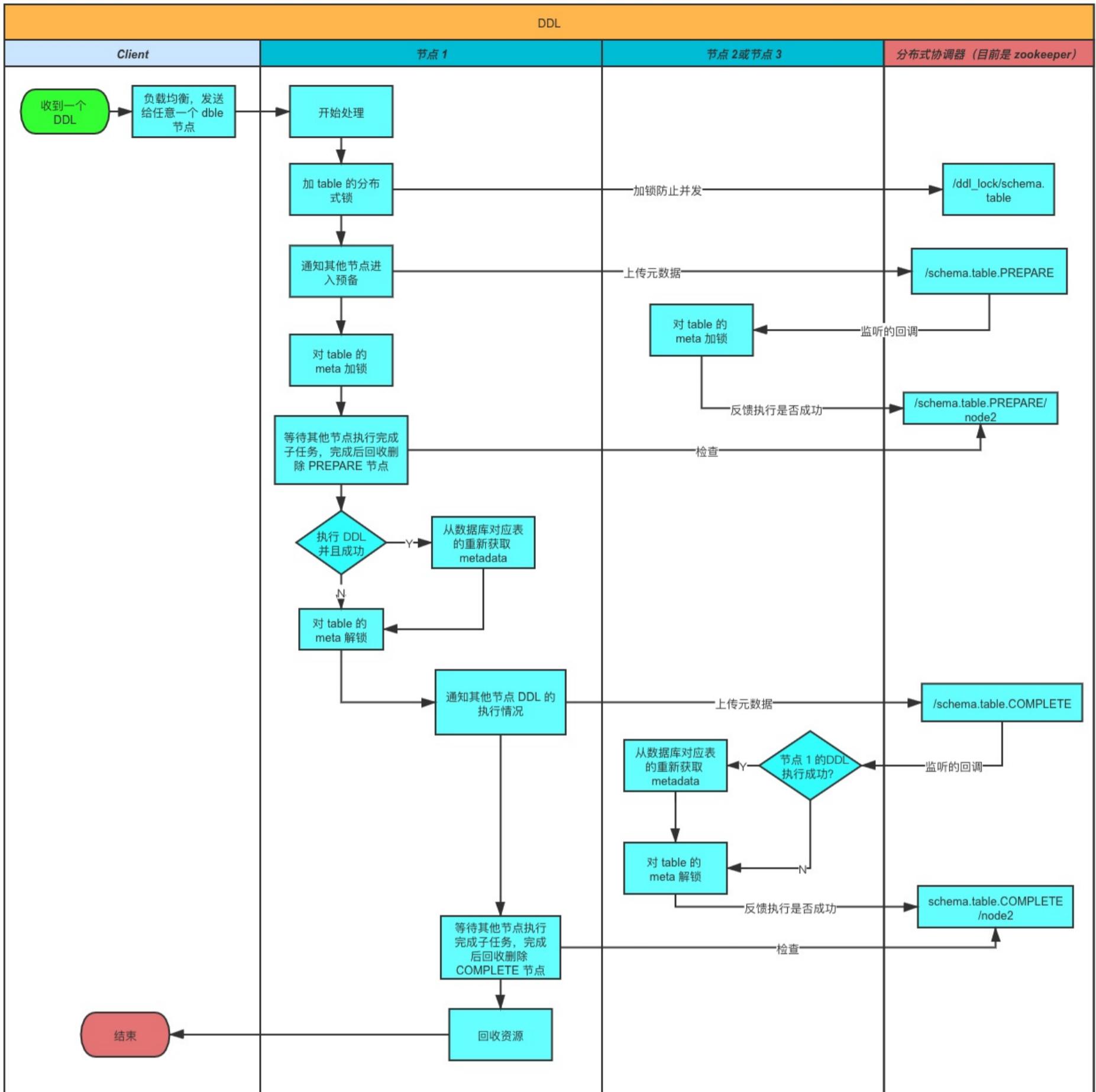
ZK



## 2.8.4

### ADDL

DDLZKZK



## 1. DDL

DDL,

## 1. ""

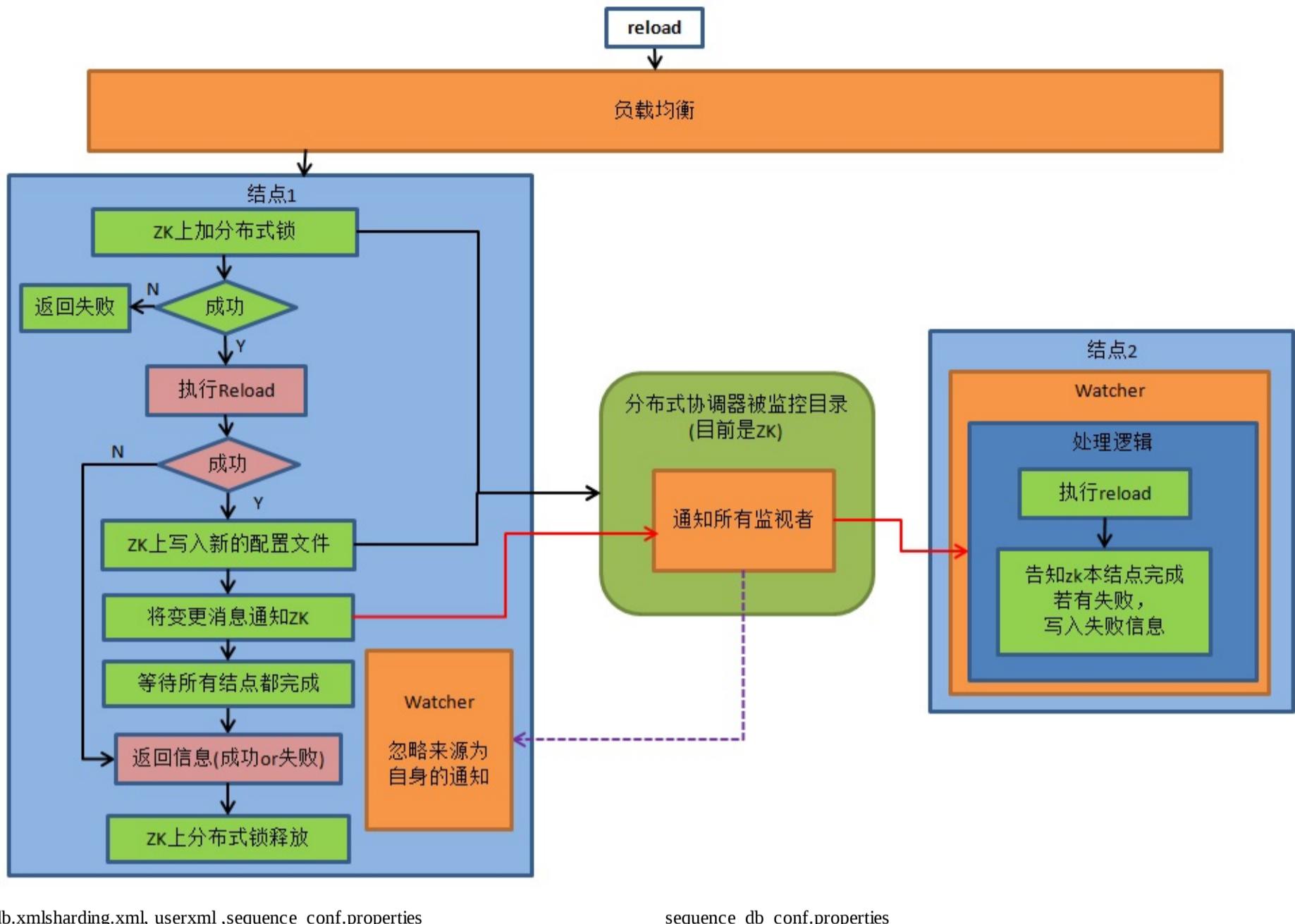
1. DDLtablemetaZKddlmetareload metadata

## 1. meta

(meta,reload meta)

## 1. :view,viewview

**B.reload @@config/ reload @@config\_all**

**C.binlog**

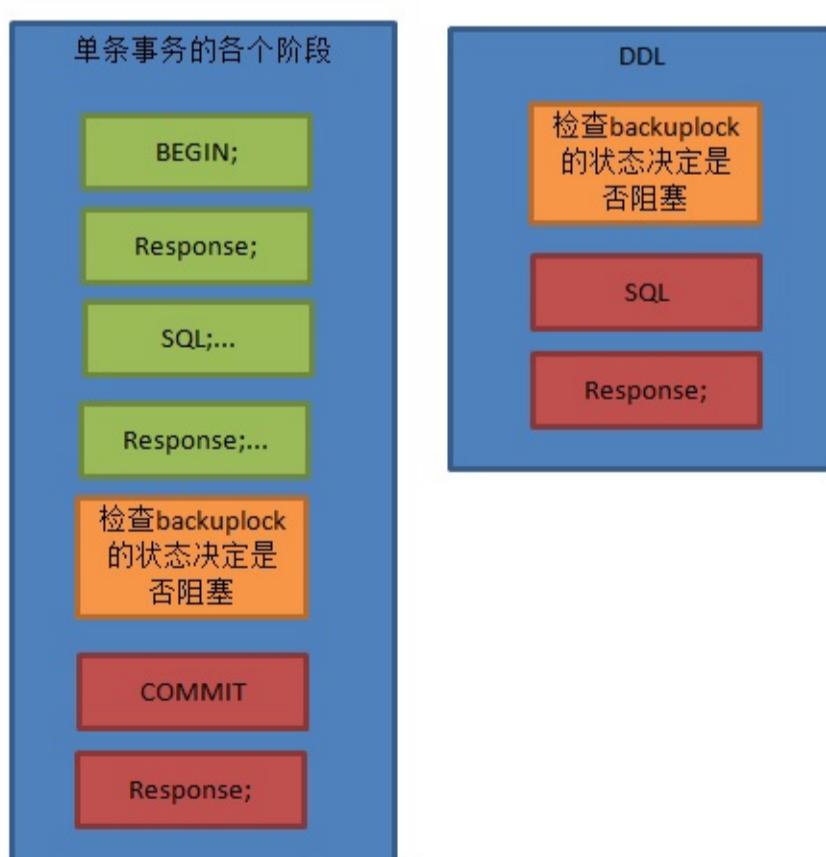
:

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)
```

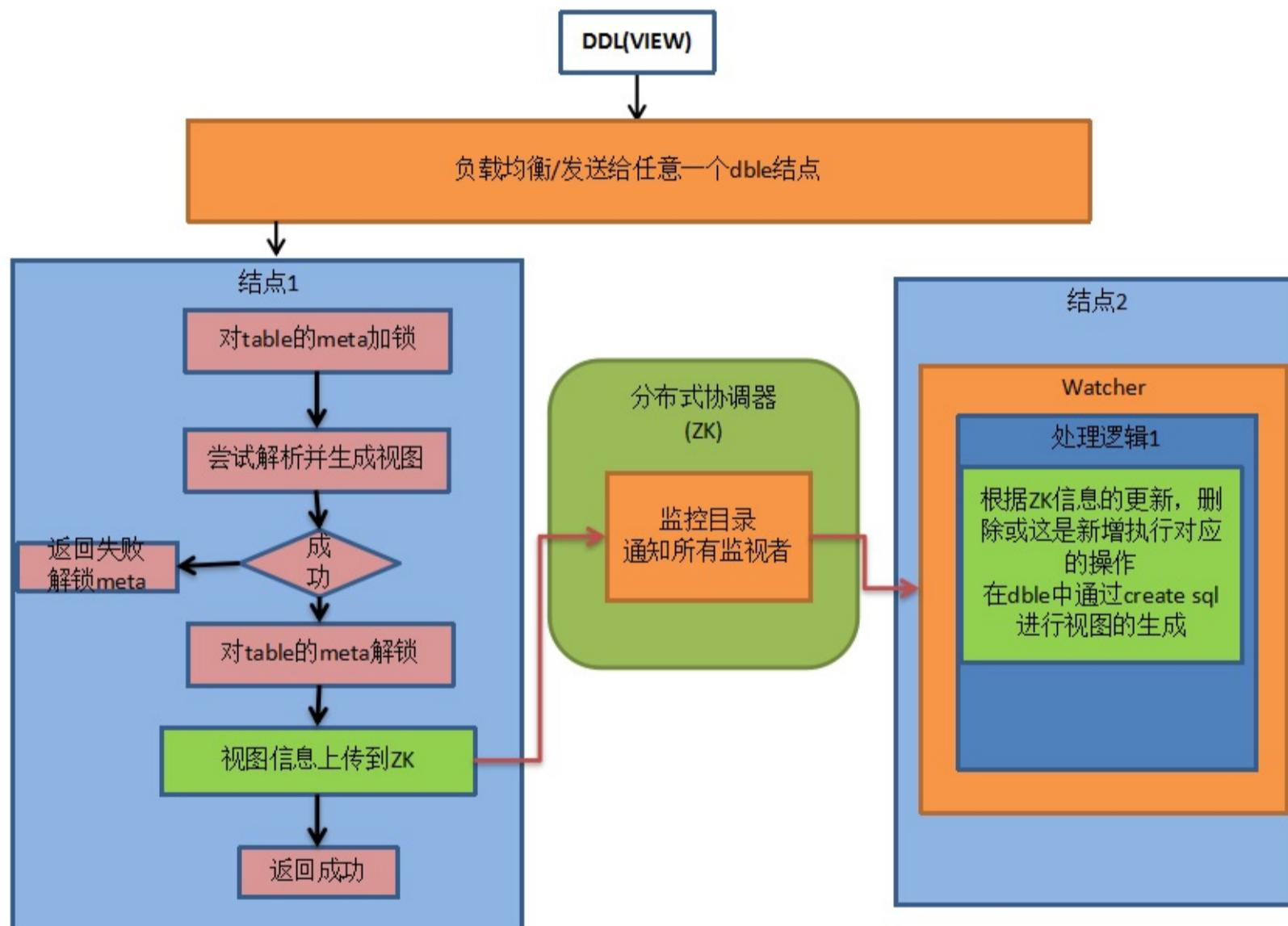
1.ZKzk  
2.session  
3./ZK  
4.,show @@binlog.status  
5.ZK

ZK

ZK/zk

**D.View**

zkview dble



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

**E.online**

dble online DDL

1.dble 2.dble DDL binlog

**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.COMPLETEdl 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:

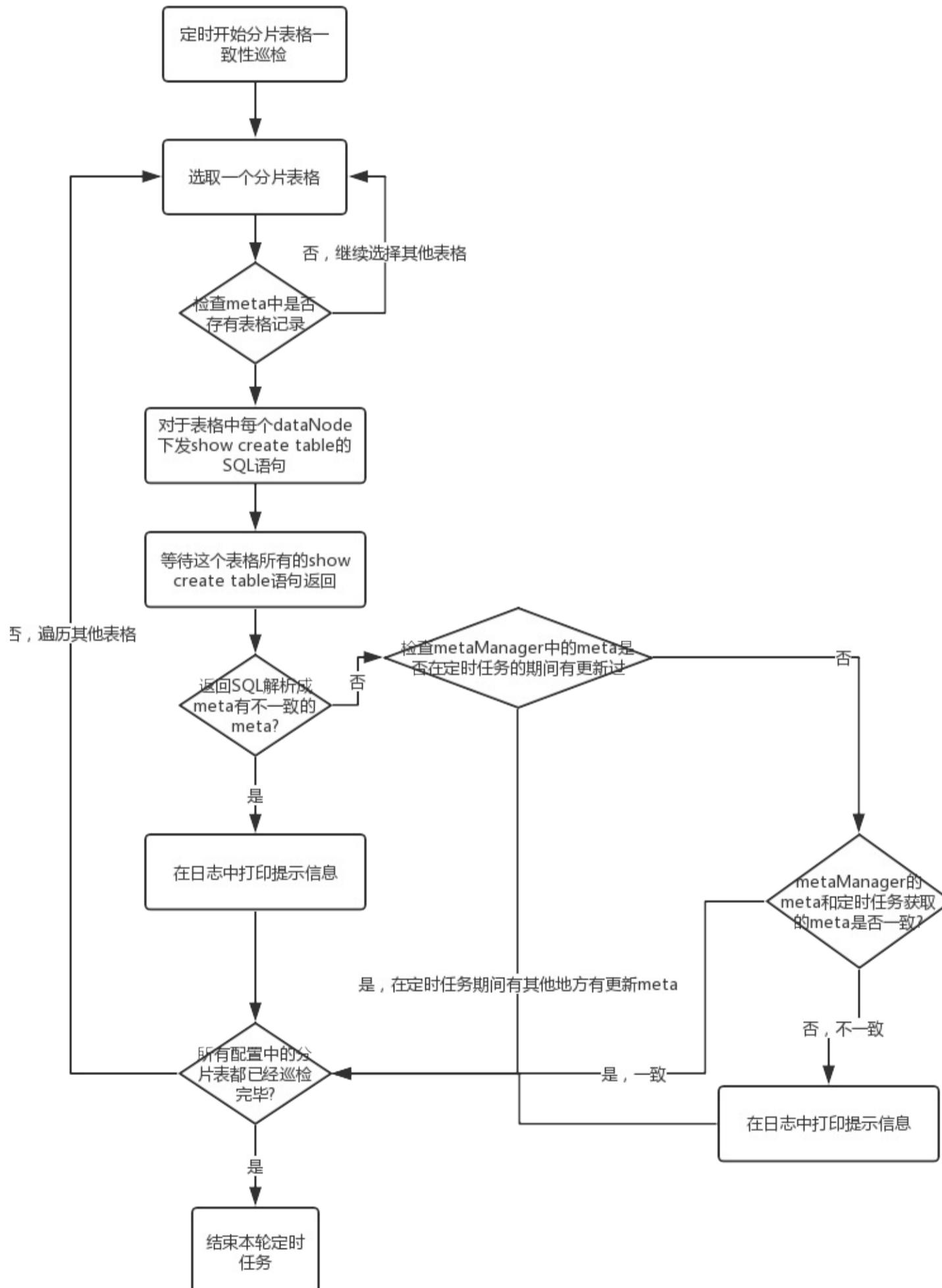
1. zookeeper
  - dbled
2. zookeeper
  - :
  - a. dblezookeeper
  - b. dblezookepr
  - c. dble

### 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 K/V

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

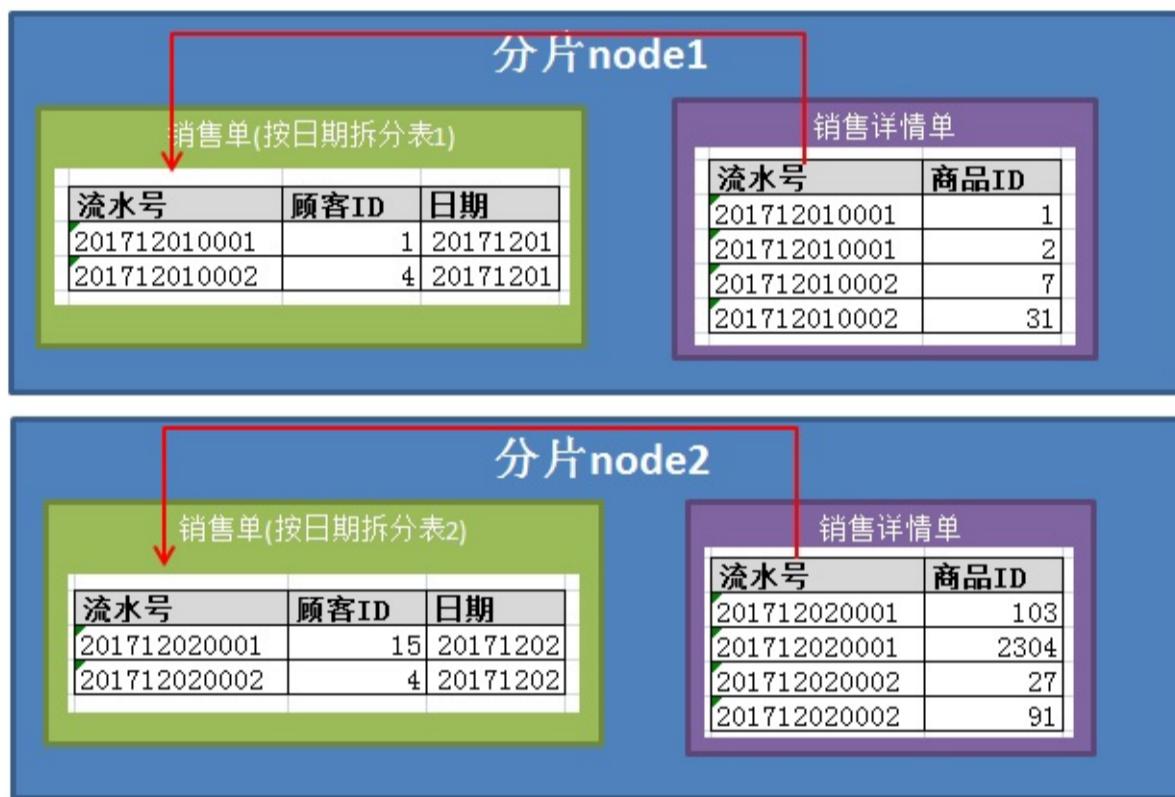
join, nest loop  
join

| 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

| <b>table</b> |      |         | <b>function</b> |   |
|--------------|------|---------|-----------------|---|
| 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

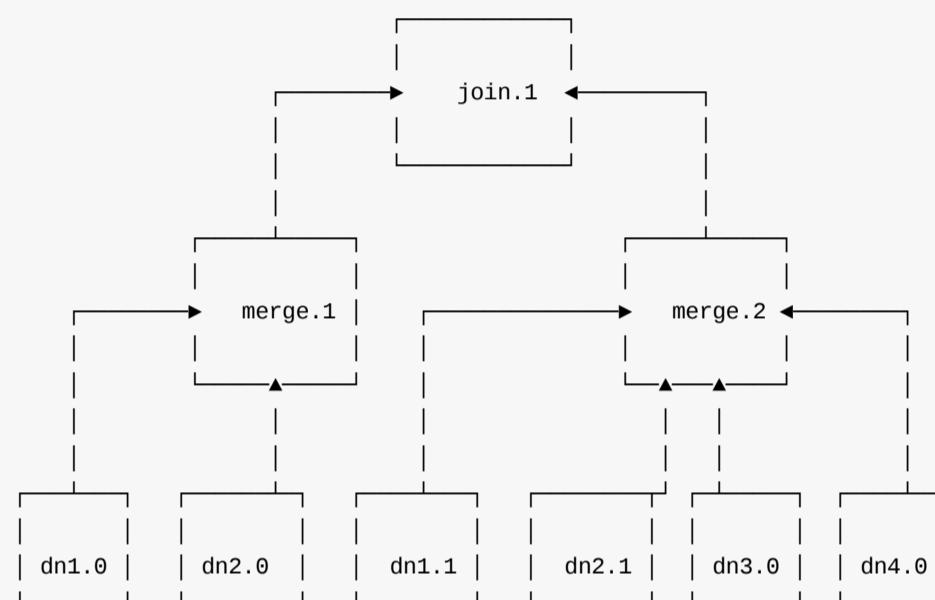
### 2.17.3.1

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()

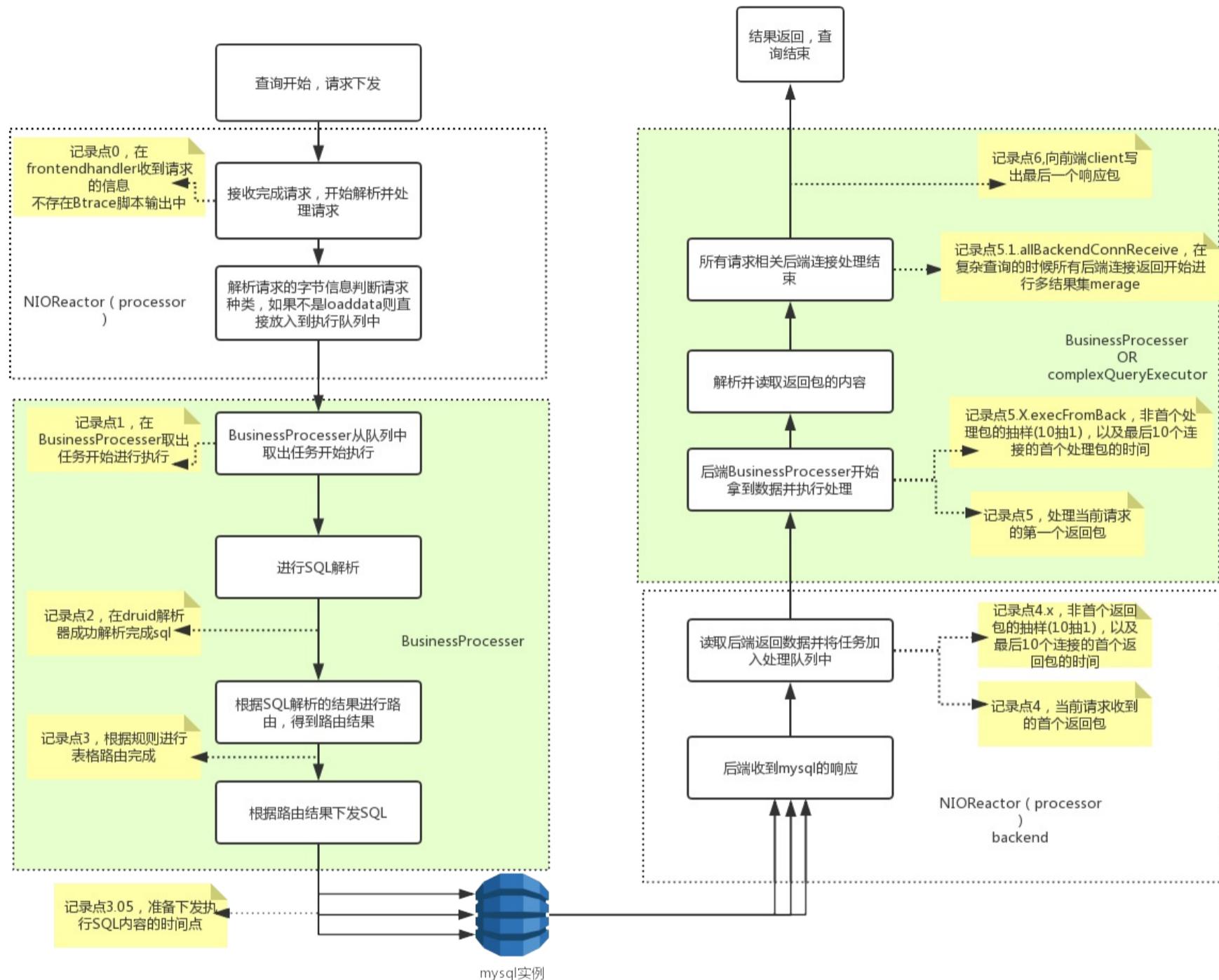
### 2.18.1 Btrace

#### 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.resFromBack dble1

- 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

```

```

# 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:

```

```

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

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# 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

```

```

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
# Read SQL      35    0.03    0.00    0.01    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 First Re  45    0.42    0.02    0.04    0.03    0.03    0.01    0.03
# dn1 Last Res  7    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    0.02
# dn2 Last Res  3    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
# 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
# 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
# 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
```

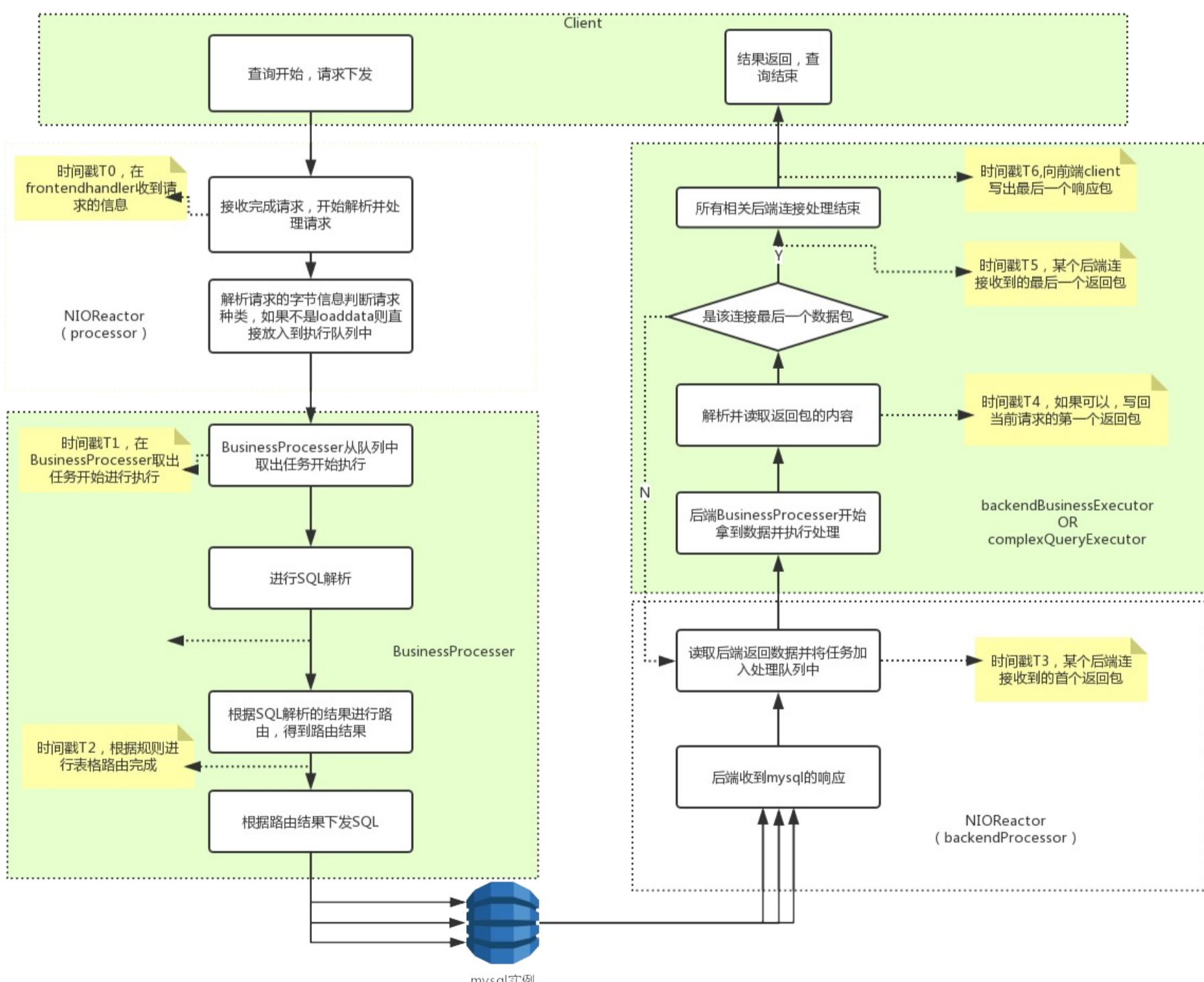
### 2.3 session

```
# 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                  | +-----+  |
| <hr/>  |           |           |           |                    |  |
| 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  |
| Generate New Query   | 12.485808 | 13.824463 | 1.338655  | -                  | -  |
| Execute SQL  | 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)

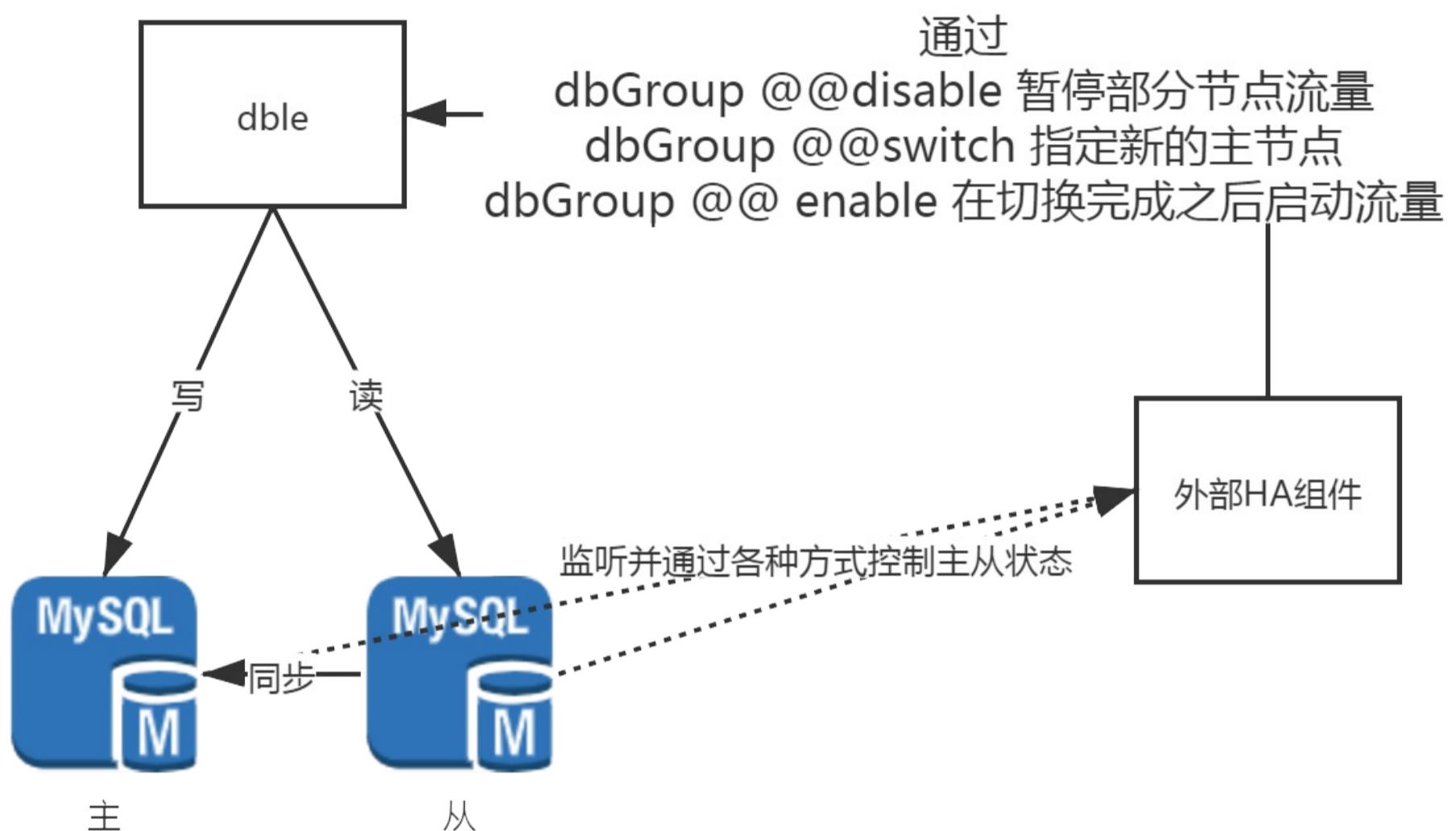
:

- (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

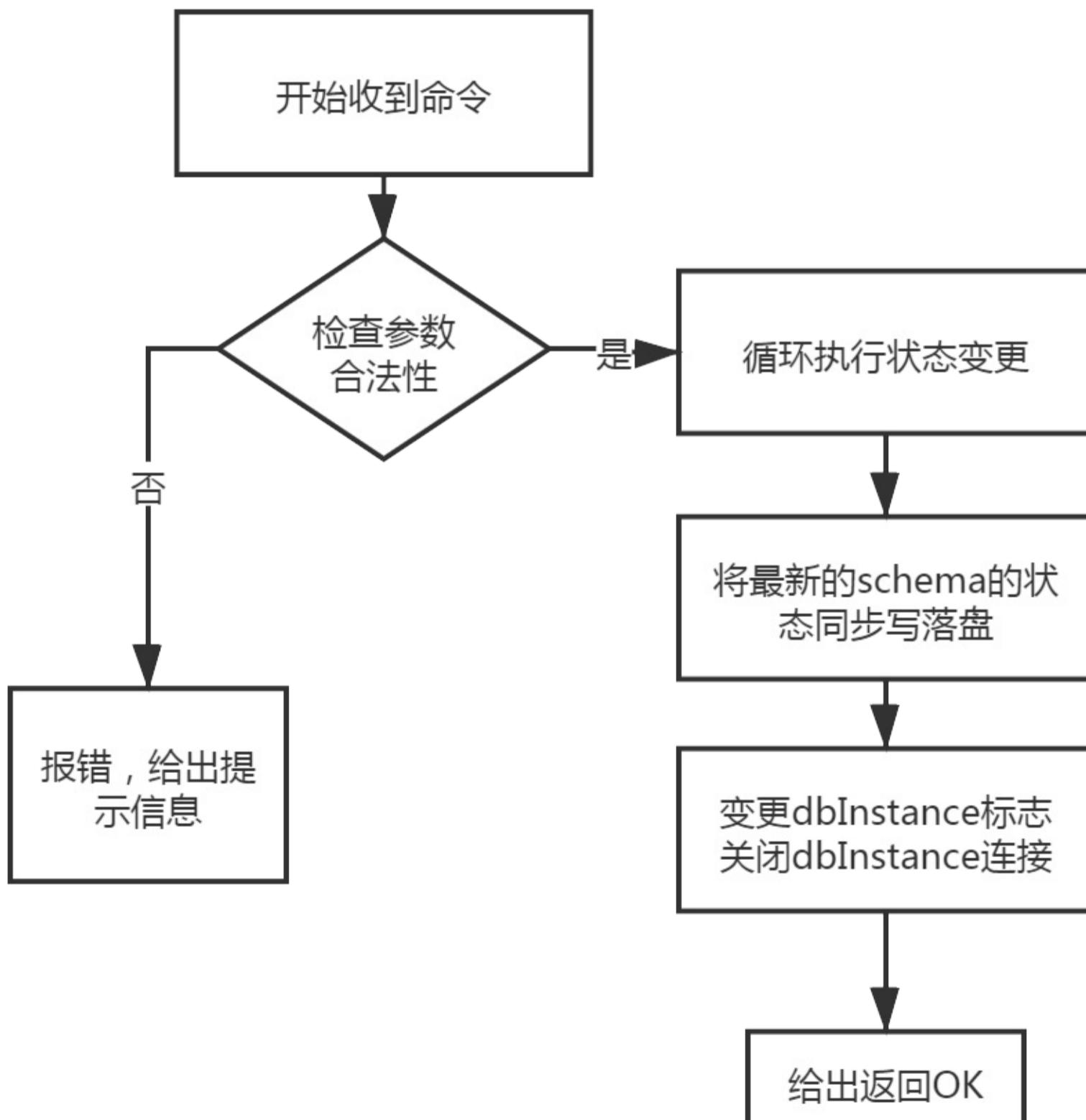
dbledbGroup

- disablezk
- enable
- switchprimary dbInstance

#### dbGroup @@disable

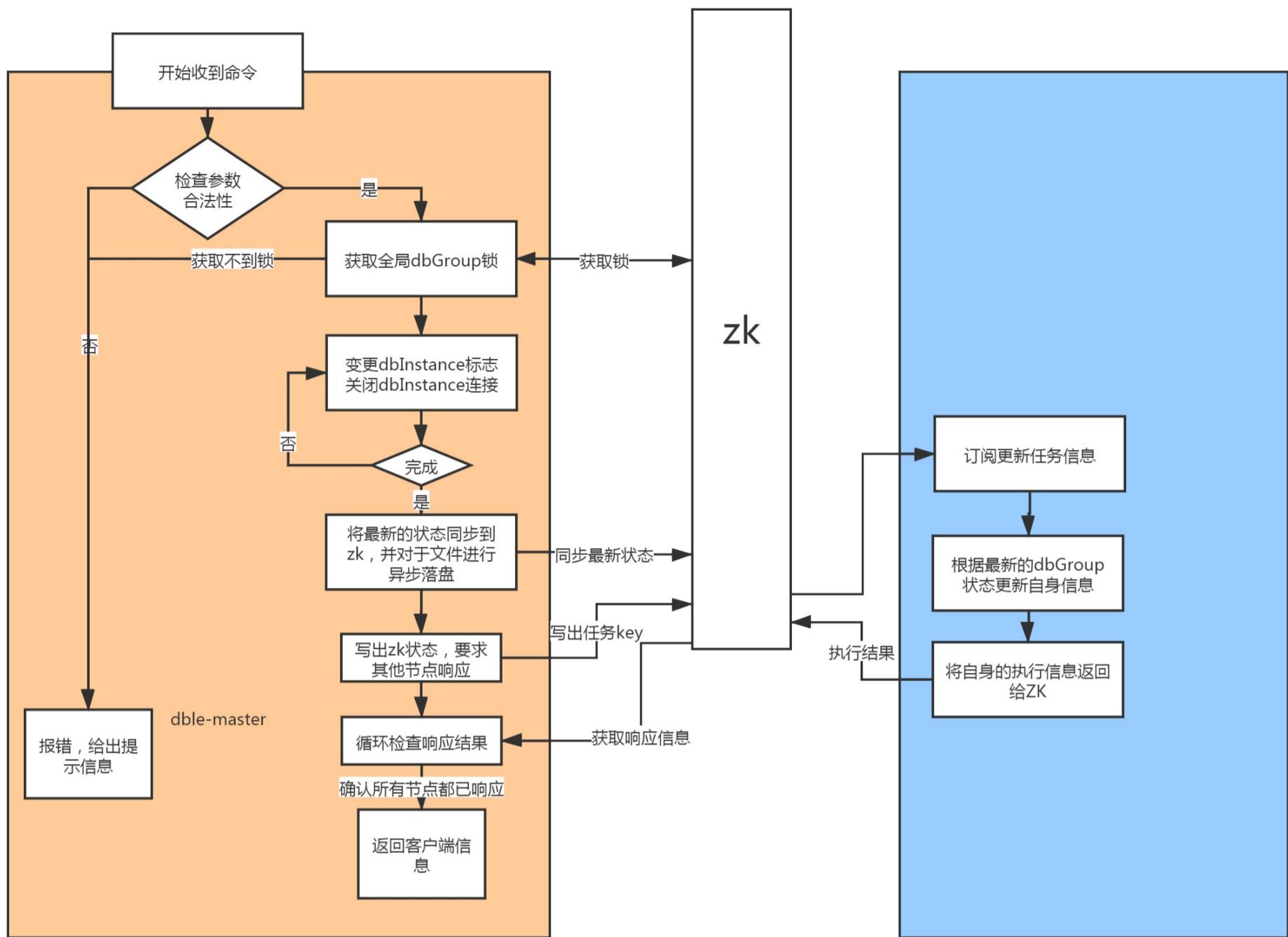
dble

- 
- dbInstance
- 
- dbGroup
- OK



- 
- dbInstance
- 
- dbGroup

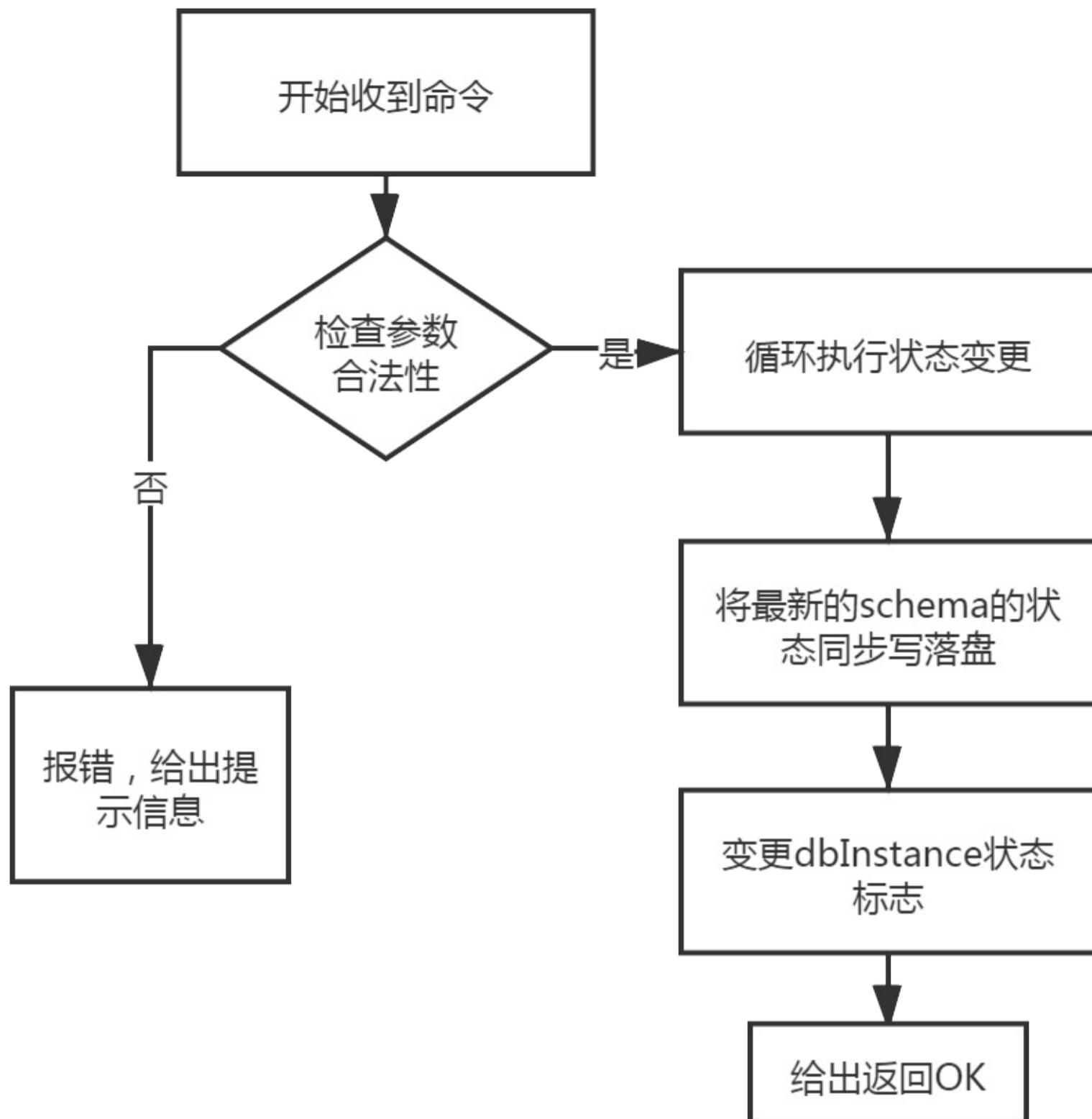
- dbGroupzk
- zkkey
- 
- dble
- 



## dbGroup @@enable

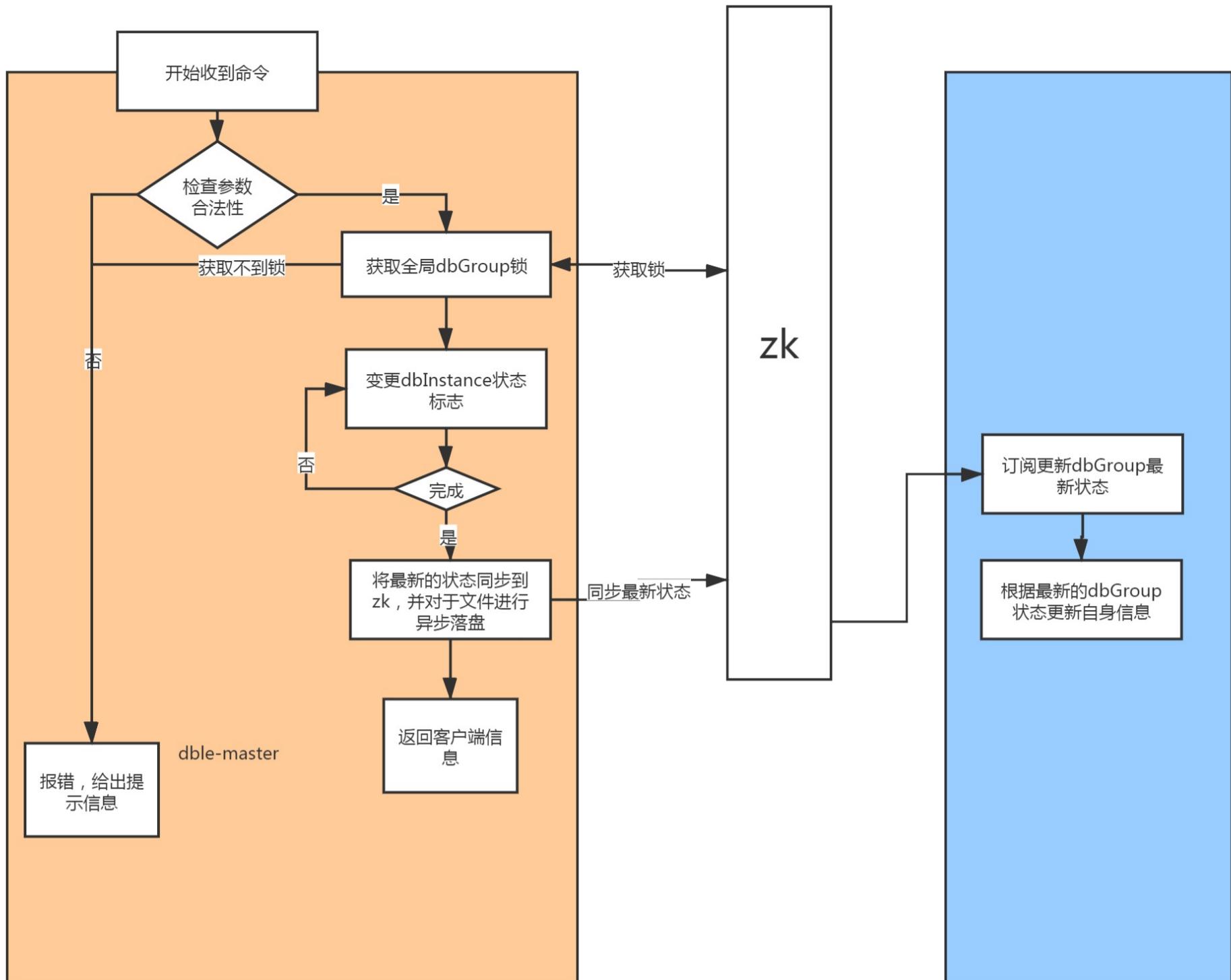
dble

- dbInstance
- dbGroup
- OK



ZK

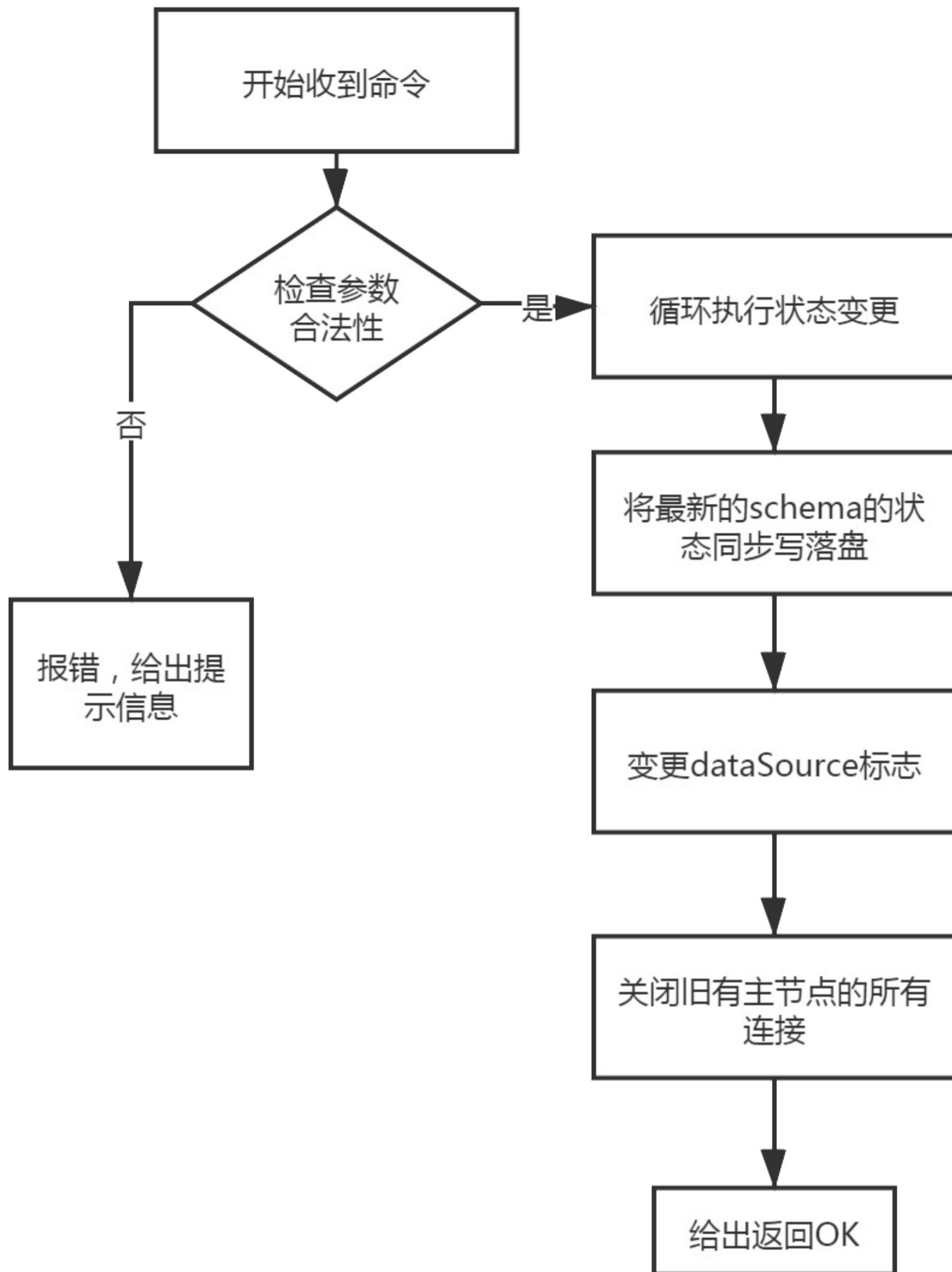
- 
- ddbInstance
- 
- dbGroup
- dbGroupzk
- zkkey
- 
- dble
-



## dbGroup @@switch

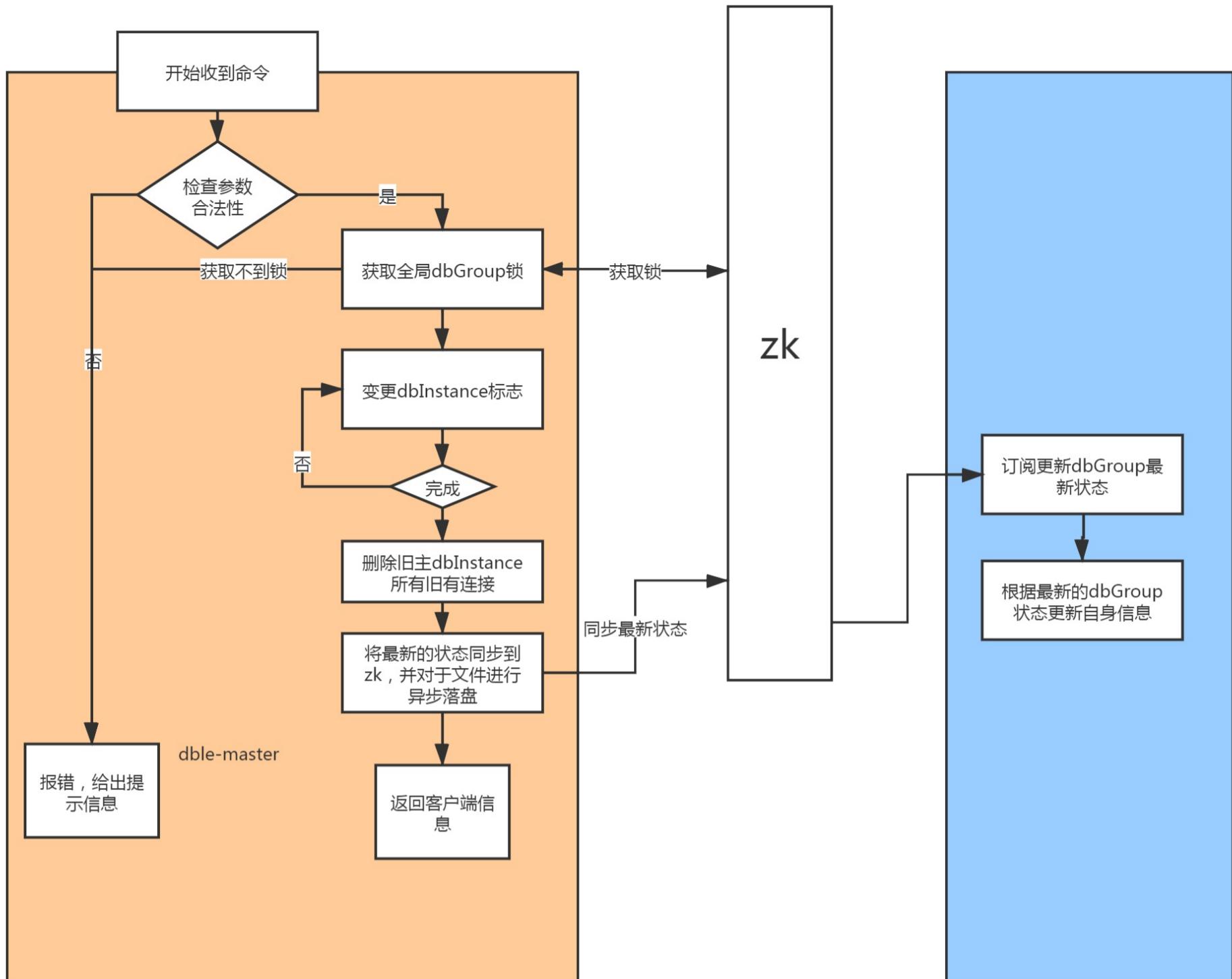
dble

- 
- dbInstance
- primary dbInstance
- dbGroup
- OK



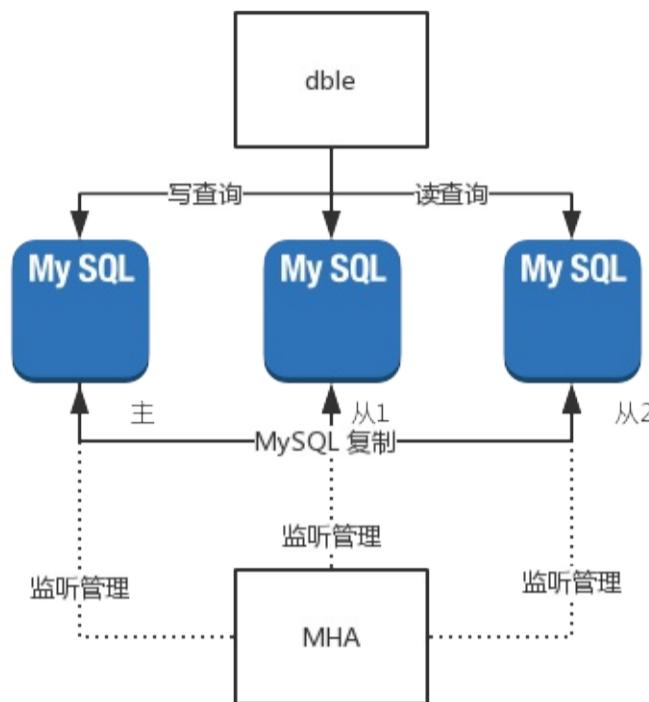
ZK

- 
- dbInstance
- 
- dbGroup
- dbGroupzk
- zkkey
- 
- dble
-

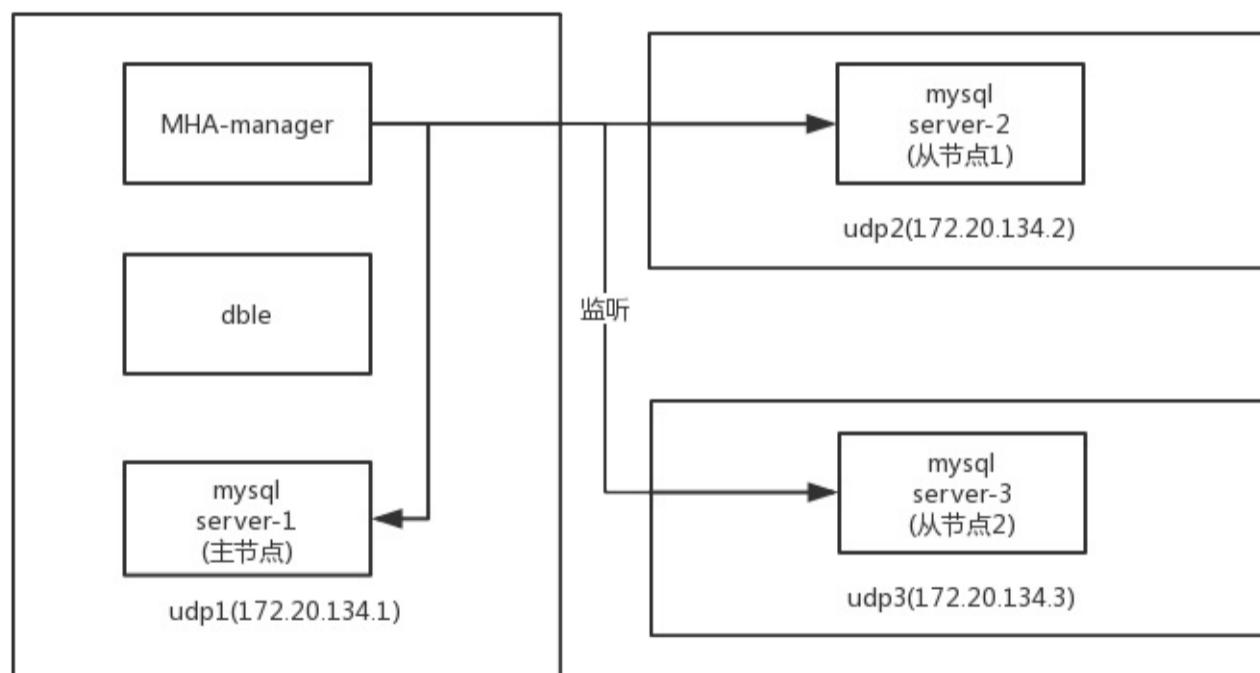


## 2.23.4 mha-dble

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](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
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#
```

```

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# 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>
```

dbleman1dbe

```
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>
```

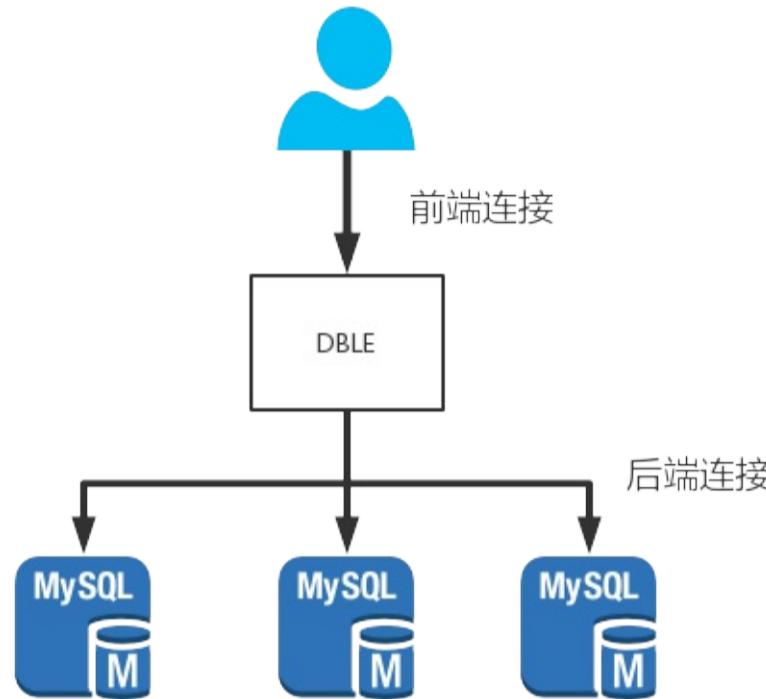
- 172.20.134.3mysql172.20.134.2dbe

```
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

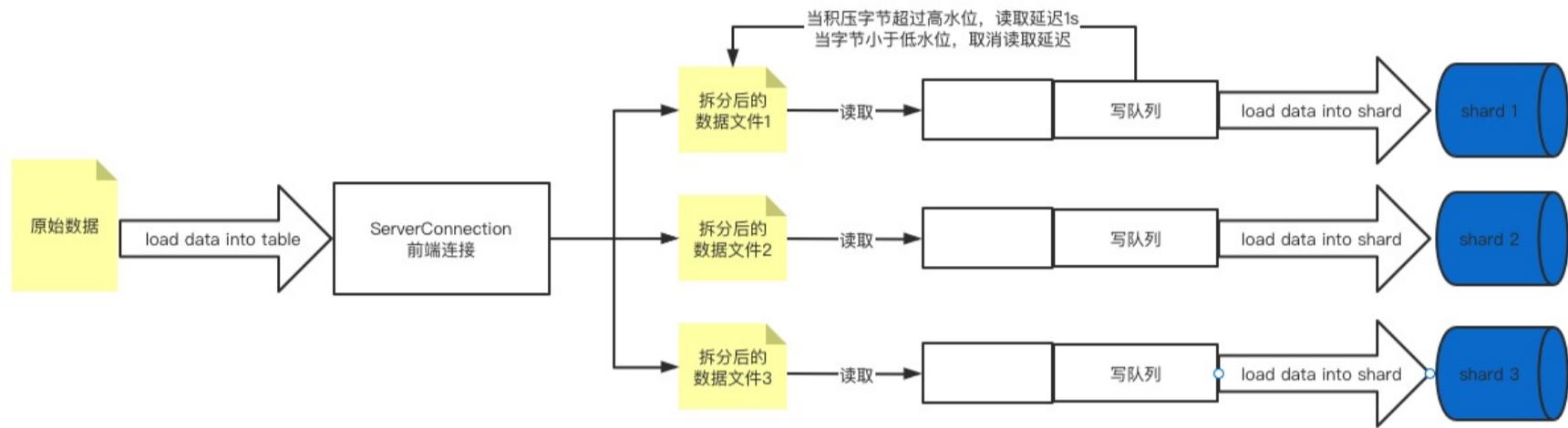
## 2.25 dble

dbleloaddbdbleOOM  
2.20.04@ssxlulu/load

dble

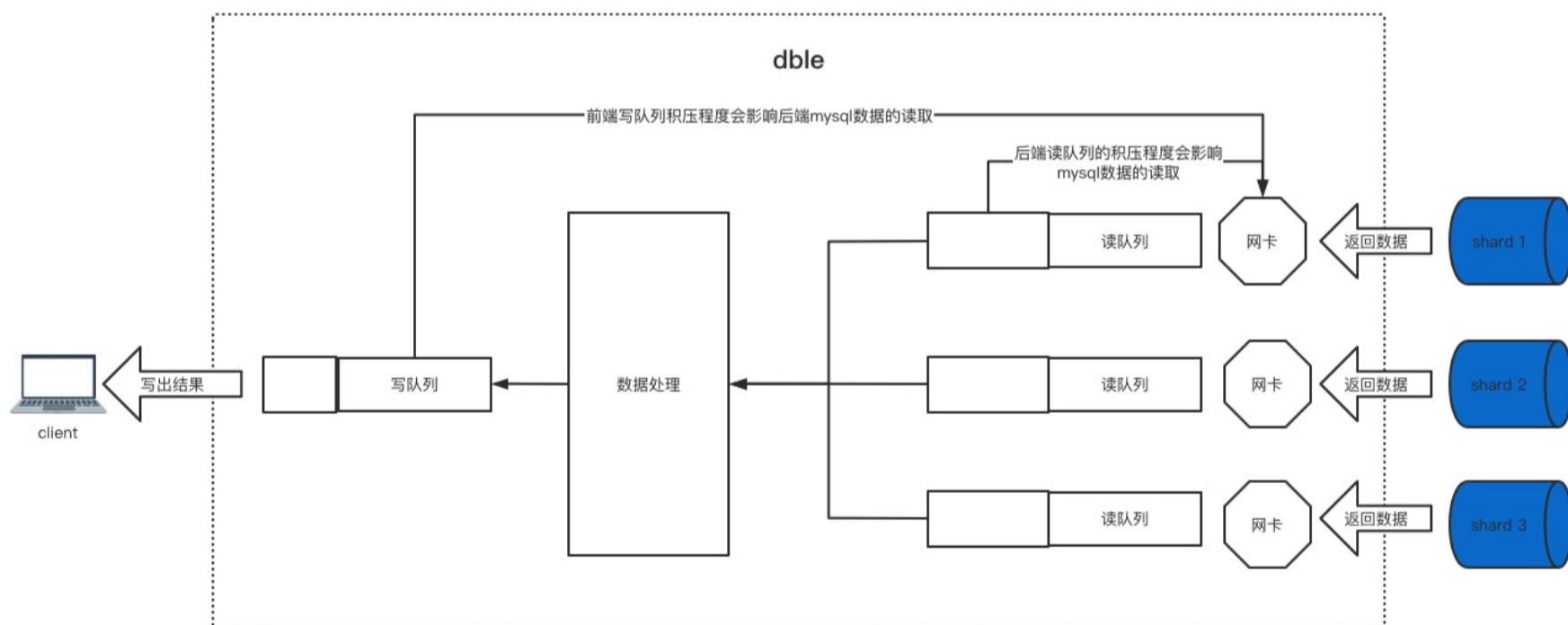
- Load data

- (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 -u man1 -h 192.xx.xx.xx -P 9066 -p 654321
enable @@cap_client_found_rows;
```

step3.

- 3.20.10.0dbleclient\_found\_rows

```
mysql -uroot -h 192.xx.xx.xx -P 8066 -p 123456
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

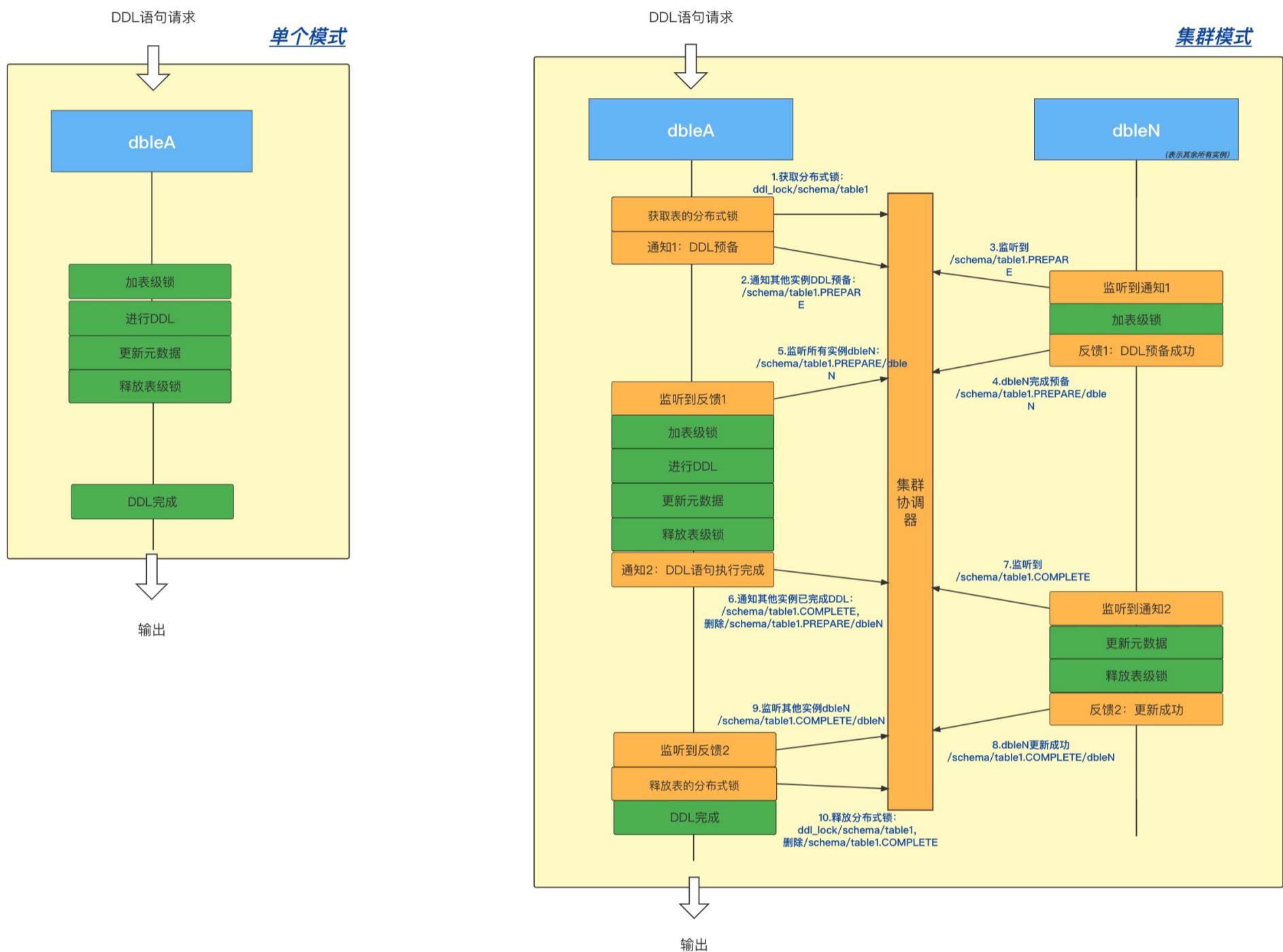
- select \* from sharding\_4\_t1 where id!=any(select id from test where age=1) order by name desc;
  - select \* from sharding\_4\_t1 where id=all(select id from test where age=1) order by name desc;

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

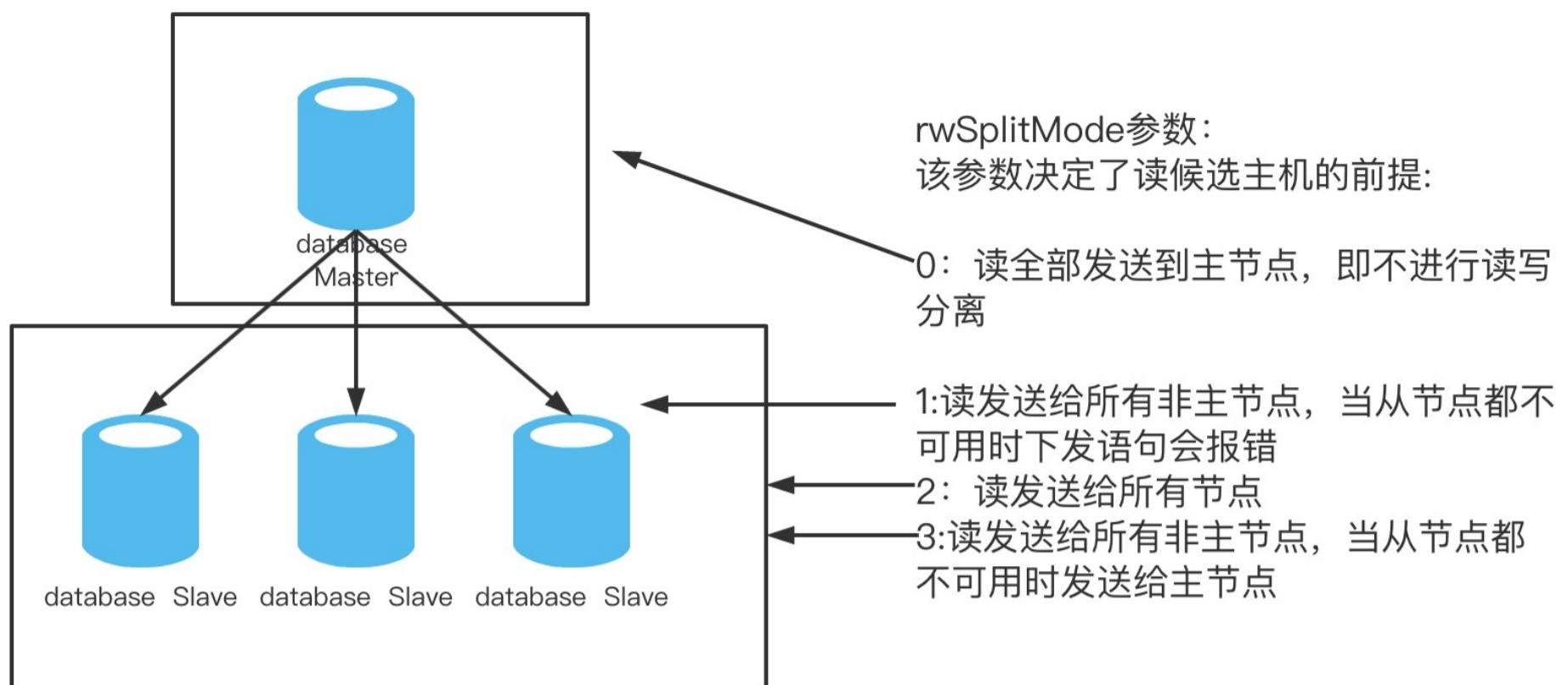
- (primary="true")
  - rwSplitMod2dbInstances
  - (primary primary="false")
    - dbInstances
    - dbInstances
- -

### 2.32.2.2

dbInstancedbInstance

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

#### 2.32.2.3 dbGrouprwSplitMode



### 2.32.3

clickhousemysqlselectdb

### 2.32.4

1. clickhouse
2. selectdb
- 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

yum yum 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
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  - 3.2.6 SELECT JOIN syntax
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- 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
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- 3.5 DAL
  - 3.5.1 SET
  - 3.5.2 SHOW
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  - 3.5.4 DAL
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- 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><br>ON <i>table</i><br>( <i>col_list</i> );ALTER<br>TABLE <i>tbl_name</i> ADD<br>INDEX <i>name</i> ( <i>col_list</i> );                   |  |                      |
| 2  |  |          | DROP INDEX <i>name</i><br>ON <i>table</i> ;ALTER<br>TABLE <i>tbl_name</i> DROP<br>INDEX <i>name</i> ;                                                             |  |                      |
| 3  |  |          | ALTER TABLE<br><i>tbl_name</i> RENAME<br>INDEX <i>old_index_name</i><br>TO <i>new_index_name</i> ,<br>ALGORITHM=INPLAC<br>E, LOCK=NONE;                           |  | mysql 5.6 online ddl |
| 4  |  | FULLTEXT | CREATE FULLTEXT<br>INDEX <i>name</i> ON<br><i>table(column)</i> ;                                                                                                 |  | mysql                |
| 5  |  | Spatial  | CREATE TABLE <i>geom</i><br>( <i>g</i> GEOMETRY NOT<br>NULL); ALTER TABLE<br><i>geom</i> ADD SPATIAL<br>INDEX( <i>g</i> ),<br>ALGORITHM=INPLAC<br>E, LOCK=SHARED; |  | mysql                |
| 6  |  |          | ALTER TABLE<br><i>tbl_name</i> DROP INDEX<br><i>i1</i> , ADD INDEX<br><i>i1(key_part,... )</i> USING<br>BTREE,<br>ALGORITHM=INSTAN<br>T;                          |  |                      |
| 7  |  |          | ALTER TABLE<br><i>tbl_name</i> ADD<br>PRIMARY KEY<br>( <i>column</i> ),<br>ALGORITHM=INPLAC<br>E, LOCK=NONE;                                                      |  |                      |
| 8  |  |          | ALTER TABLE<br><i>tbl_name</i> DROP<br>PRIMARY KEY,<br>ALGORITHM=COPY;                                                                                            |  | COPYdml              |
| 9  |  |          | ALTER TABLE<br><i>tbl_name</i> DROP<br>PRIMARY KEY, ADD<br>PRIMARY KEY<br>( <i>column</i> ),<br>ALGORITHM=INPLAC<br>E, LOCK=NONE;                                 |  |                      |
| 10 |  |          | ALTER TABLE<br><i>tbl_name</i> ADD<br>COLUMN<br><i>column_name</i><br><i>column_definition</i> ,<br>ALGORITHM=INSTAN<br>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_name 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><br><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<br>ALWAYS AS (c1 + 1)<br>STORED FIRST,<br>ALGORITHM=COPY;                                        |  |       |
| 26 |  | Generated | ALTER TABLE t1<br>DROP COLUMN c2,<br>ALGORITHM=INPLACE,<br>LOCK=NONE;                                          |  |       |
| 27 |  | VIRTUAL   | ALTER TABLE t1 ADD<br>COLUMN (c2 INT<br>GENERATED ALWAYS<br>AS (c1 + 1) VIRTUAL),<br>ALGORITHM=INSTANT;        |  |       |
| 28 |  | VIRTUAL   | ALTER TABLE t1<br>MODIFY COLUMN c2<br>INT GENERATED<br>ALWAYS AS (c1 + 1)<br>VIRTUAL FIRST,<br>ALGORITHM=COPY; |  |       |
| 29 |  | VIRTUAL   | ALTER TABLE t1<br>DROP COLUMN c2,<br>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'1'1dbeissue <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\\_SQL\\_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;
```

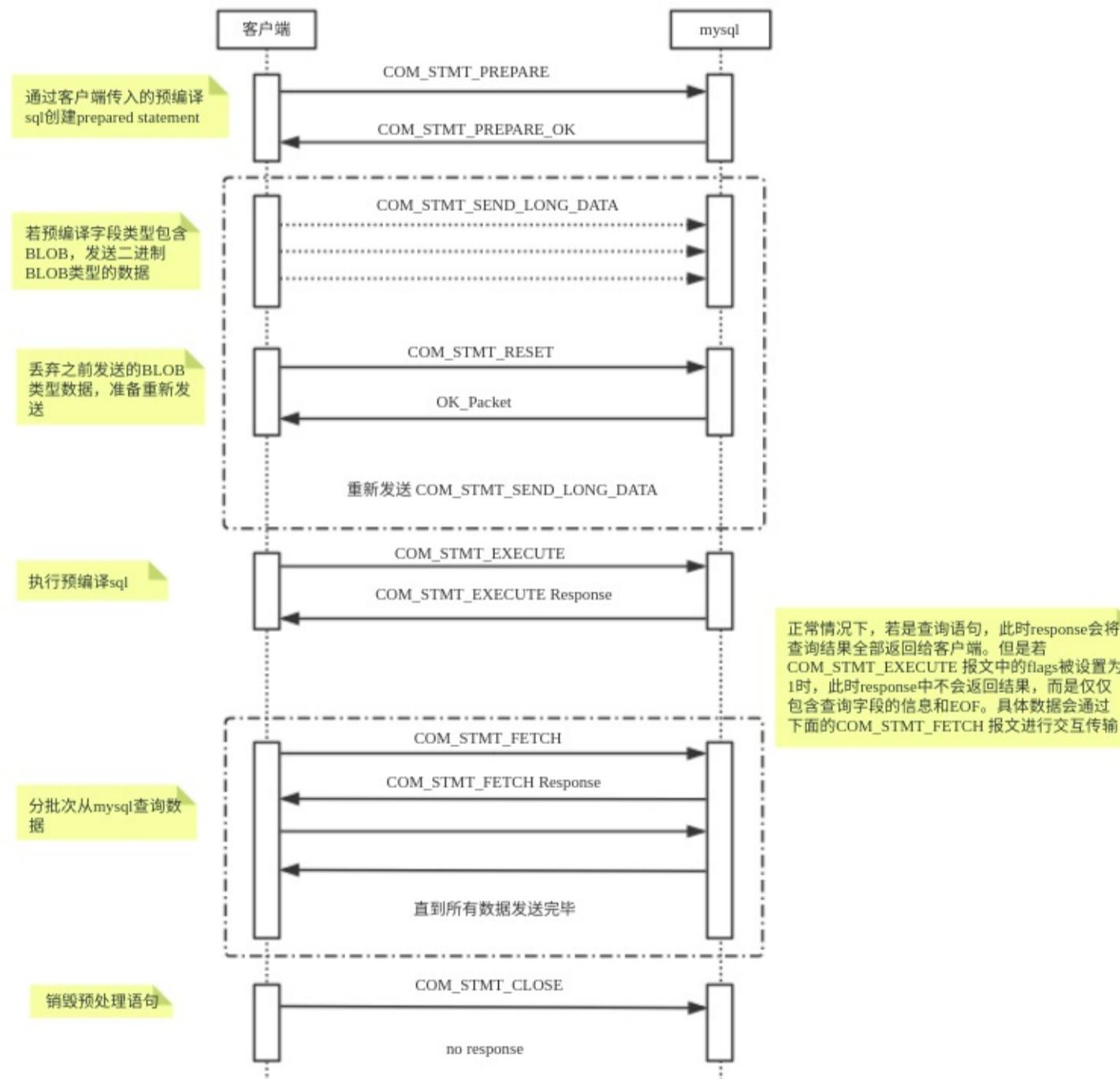
### 4.4.2

mysql

### 4.4.4

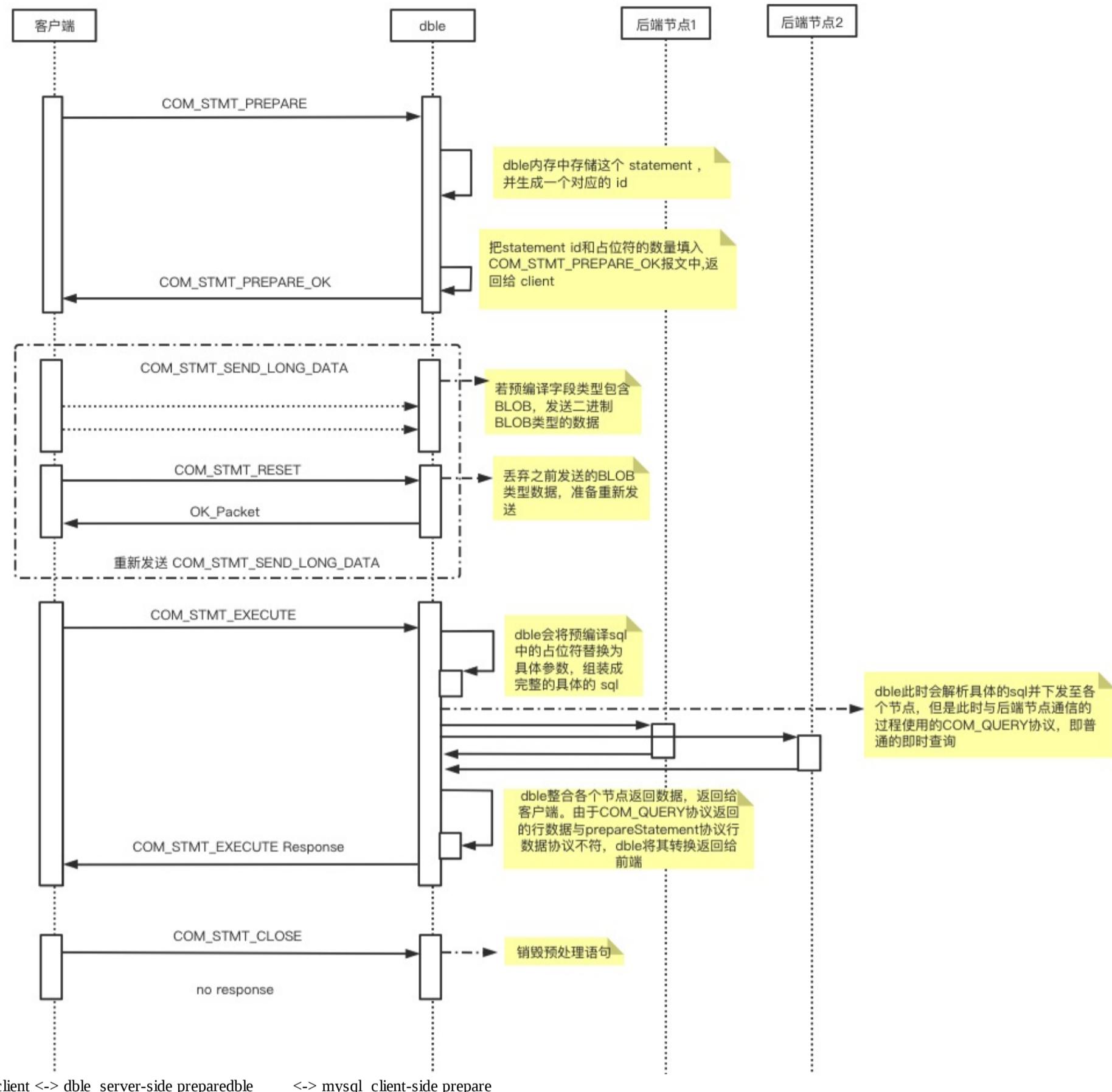
- server-side prepare client PS server server
- client-side prepare : client PS prepare SQL server server ""

### 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

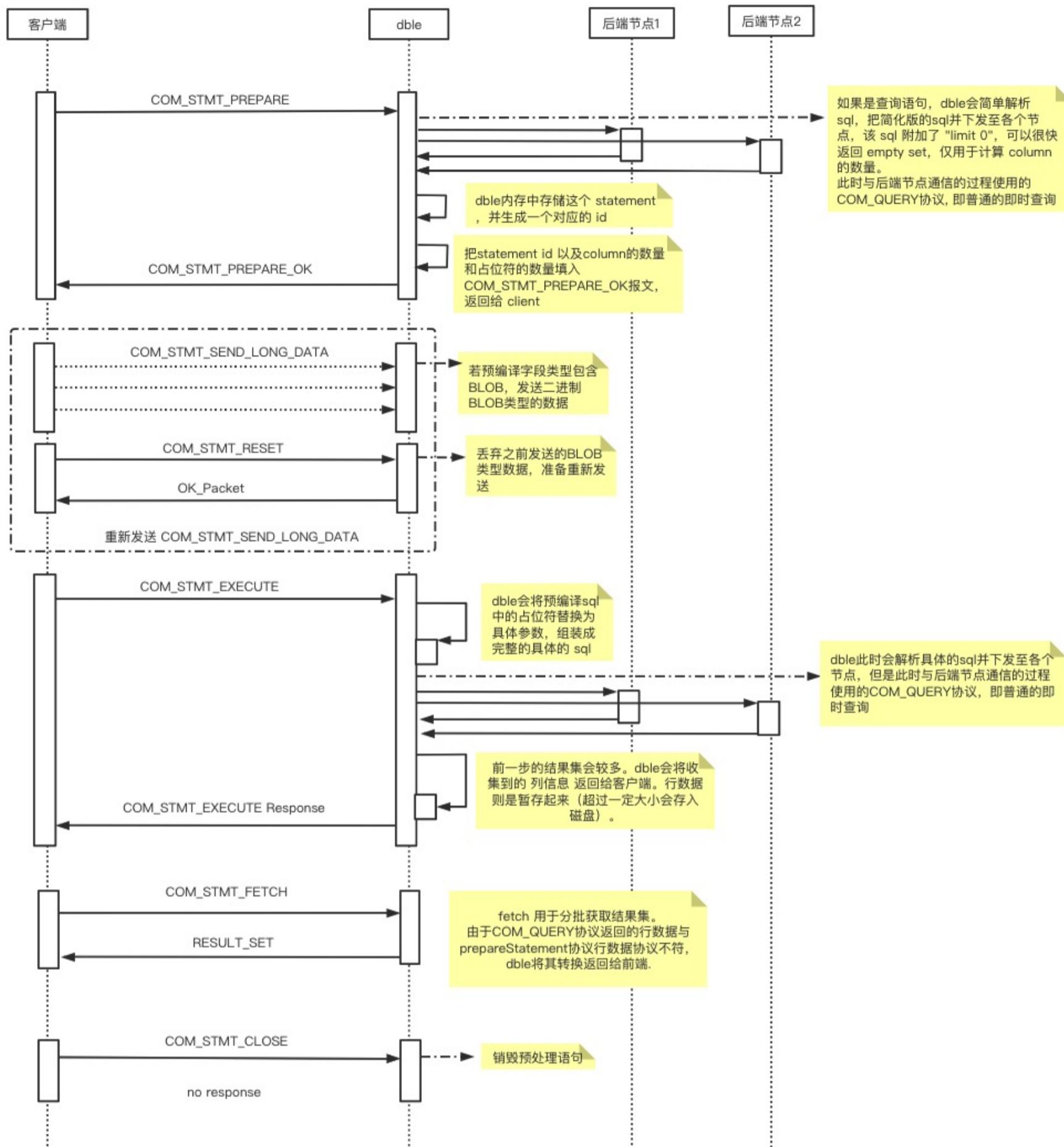
1. drivermysqljdbc driver
2. jdbcuseServerPrepStmtsuseCursorFetch
3. prepareStatement fetchSize 0.
4. execute

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. `JDBCrewiteBatchedStatements=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;
```

```
EXPLAINSQ 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 + "");
            }
        }
    }
}

```

```

String querySQL = "select * from " + tableName + " order by id";
System.out.println("Execute SQL:\n\t"+querySQL);
ResultSet rs = st.executeQuery(querySQL);
int colcount = rs.getMetaData().getColumnCount();
System.out.println("Current Data:");
while(rs.next()){
    for(int i=1;i<=colcount;i++){
        System.out.print("\t"+rs.getString(i));
    }
    System.out.println();
}

String updateSql = "update " + tableName + " set title='test1' where id=1";
System.out.println("Execute SQL:\n\t"+updateSql);
st.execute(updateSql);
rs = st.executeQuery(querySQL);
System.out.println("Current Data:");
while(rs.next()){
    for(int i=1;i<=colcount;i++){
        System.out.print("\t"+rs.getString(i));
    }
    System.out.println();
}

String deleteSql = "delete from " + tableName + " where id=2";
System.out.println("Execute SQL:\n\t"+deleteSql);
st.execute(deleteSql);
rs = st.executeQuery(querySQL);
System.out.println("Current Data:");
while(rs.next()){
    for(int i=1;i<=colcount;i++){
        System.out.print("\t"+rs.getString(i));
    }
    System.out.println();
}

String createIndexSql = "create index idx_1 on " + tableName + "(title)";
System.out.println("Execute SQL:\n\t"+createIndexSql);
st.execute(createIndexSql);

String dropIndexSql = "drop index idx_1 on " + tableName;
System.out.println("Execute SQL:\n\t"+dropIndexSql);
st.execute(dropIndexSql);
} catch (Exception e) {
    System.out.println(new java.util.Date().toString());
    e.printStackTrace();
} finally {
    if (ps != null)
        try {
            ps.close();
        } catch (SQLException e1) {
            e1.printStackTrace();
        }
    if (connection != null)
        try {
            connection.close();
        } catch (SQLException e1) {
            e1.printStackTrace();
        }
    this.countDownLatch.countDown();
}
}
}

```

### 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.tanukisoftware.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

NodeA NodeB NodeC NodeD ABCDANode 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

