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dble

3.22.01.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
- : 86-13718877200,
- : 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

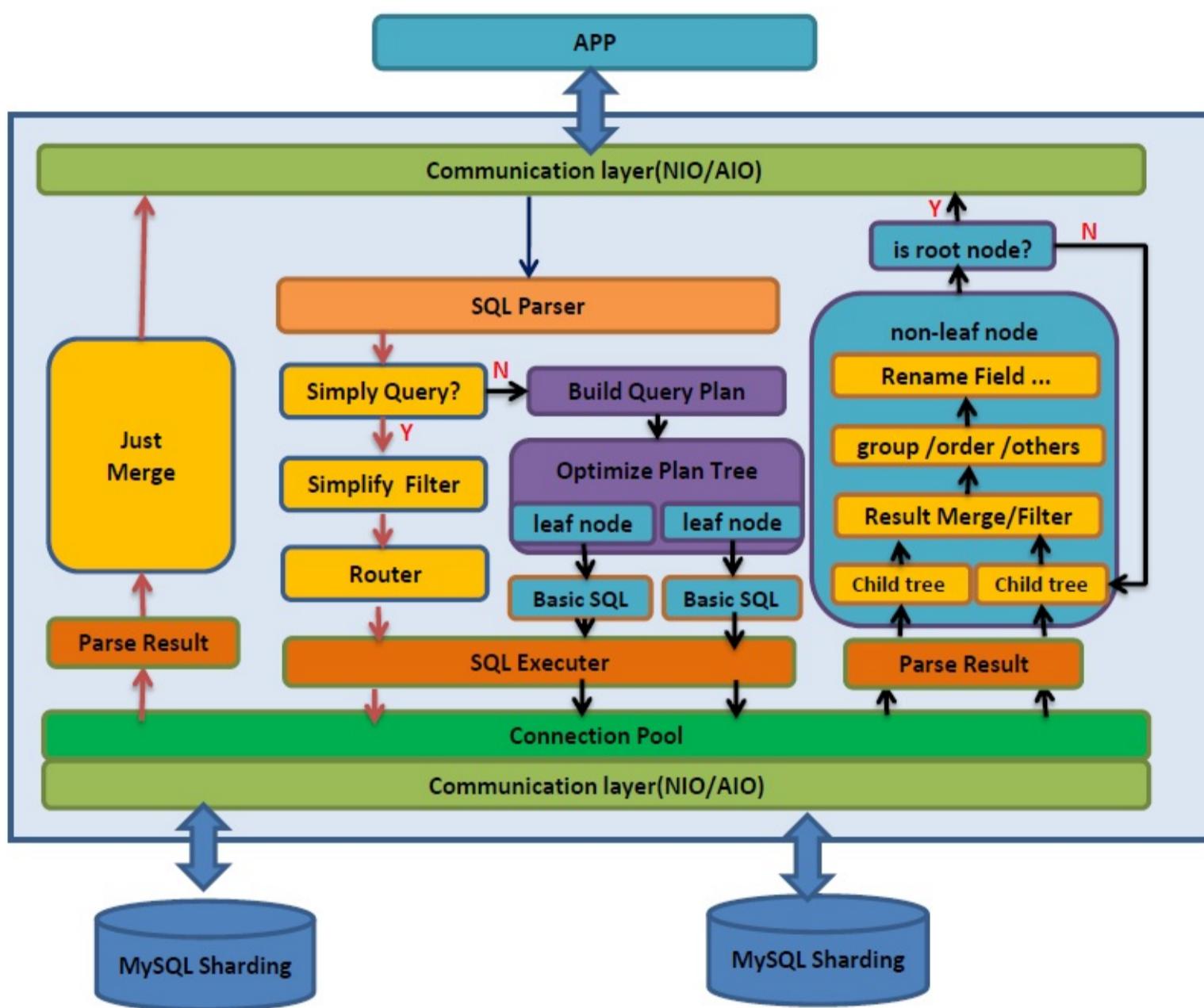
dblemysql

- dbleMySQL
- MySQL MySQLMySQL
- dble
- SQL SQL 92MySQLSQLgroup by order by distinctjoinunionsub-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

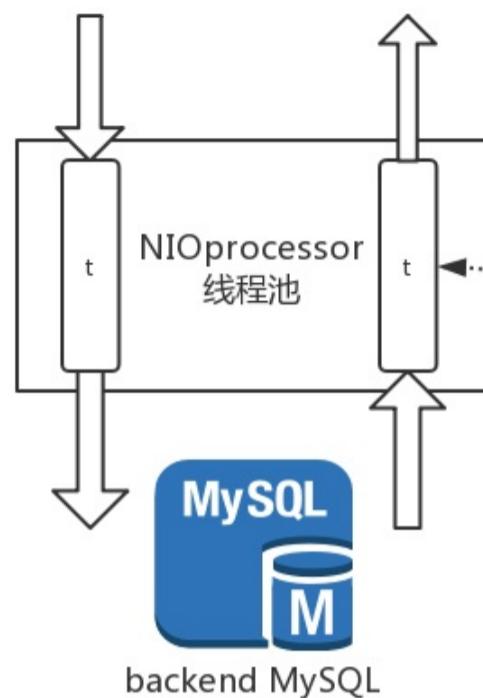
- HASH
-
- set
-
- writeType=1
- handleDistributedTransactions

0.2.5

[DBLEMyCAT](#)

0.2.6 2

Mycat以及dble 2.18.02之前版本



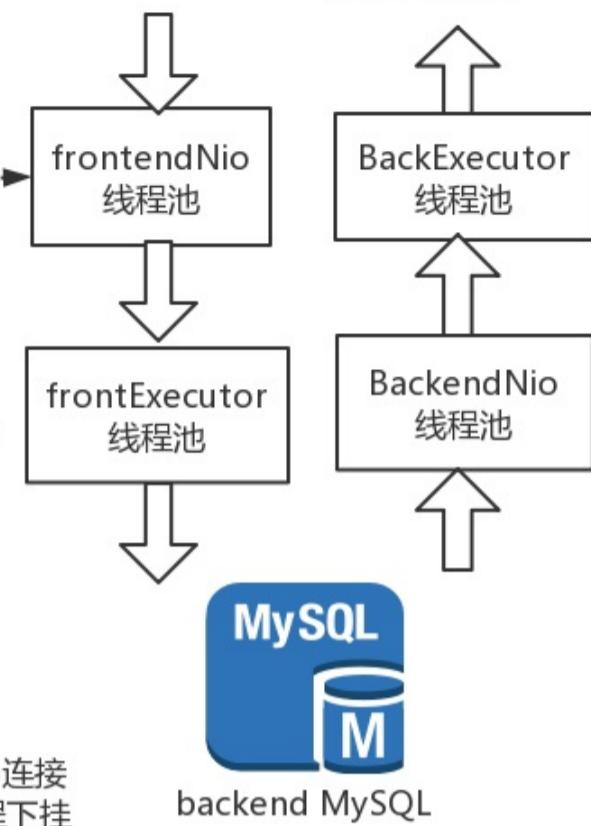
Nio处理器线程负责所有逻辑
包括数据接收(IO)
解析路由(内部计算)
请求下发(IO)等

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

- dbledble

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

```
dblejavavdblejava1.8JAVA_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
- mysql dble654321 mysql -p -P9066 -h 127.0.0.1 -u man1
- mysqlschema

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

- mysql dble123456 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"="dble-net" --subnet 172.18.0.0/16 dble-net
docker run --name backend-mysql1 --ip 172.18.0.2 -e MYSQL_ROOT_PASSWORD=123456 -p 33061:3306 --network=dble-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=dble-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=dble-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.ymldble-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.shself_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
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:
Last_SQL_Erno: 0
Last_SQL_Error:
Replicate_Ignore_Server_Ids:
Master_Server_Id: 1
Master_UUID: 46bb9692-e5f3-11ea-8340-0242ac110002
Master_Info_File: /var/lib/mysql/master.info
SQL_Delay: 0
SQL_Remaining_Delay: NULL
Slave_SQL_Running_State: Slave has read all relay log; waiting for more updates
Master_Retry_Count: 86400
Master_Bind:
Last_IO_Error_Timestamp:
Last_SQL_Error_Timestamp:
Master_SSL_Crl:
Master_SSL_Crlpath:
Retrieved_Gtid_Set:
Executed_Gtid_Set:
Auto_Position: 0
Replicate_Rewrite_DB:
Channel_Name:
Master_TLS_Version:
1 row in set (0.00 sec)

```

0.3.2.5.2 mgr

1. mgr

```

[root@localhost]docker-images# docker exec mgr-a-1 mysql -h127.0.0.1 -p3306 -uroot -p123456 \
-e "SHOW STATUS LIKE 'group_replication_primary_member';" \
-e "SELECT * FROM performance_schema.replication_group_members;""

+-----+-----+
| Variable_name | Value |
+-----+-----+
| group_replication_primary_member | 72da84d7-0c4b-11eb-9f0e-0242ac120002 |
+-----+-----+
+-----+-----+-----+-----+-----+
| CHANNEL_NAME | MEMBER_ID | MEMBER_HOST | MEMBER_PORT | MEMBER_STATE |
+-----+-----+-----+-----+-----+
| group_replication_applier | 72da84d7-0c4b-11eb-9f0e-0242ac120002 | mgr-a-1 | 3306 | ONLINE |
| group_replication_applier | 7314efdd-0c4b-11eb-ba28-0242ac120004 | mgr-a-3 | 3306 | ONLINE |
| group_replication_applier | 733b00fe-0c4b-11eb-bbea-0242ac120003 | mgr-a-2 | 3306 | ONLINE |
+-----+-----+-----+-----+-----+

[root@localhost]docker-images# docker exec mgr-b-1 mysql -h127.0.0.1 -p3306 -uroot -p123456 \
-e "SHOW STATUS LIKE 'group_replication_primary_member';" \
-e "SELECT * FROM performance_schema.replication_group_members;"

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

```

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

```

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

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

<dbGroup name="dbGroup1" rwSplitMode="2" delayThreshold="100">
<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-1dble-servercustom_mysql_ha.log172.18.0.2:3066...is not alive

```
[root@localhost]docker-images# docker-compose stop mgr-a-1
```

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

<dbGroup name="dbGroup1" rwSplitMode="2" delayThreshold="100">
    <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](#):JVM dble
 - [user.xml](#):dble
 - [db.xml](#)
 - [sharding.xml](#)
 - [log4j.xml](#)[log4j2.xml](#)
 -
 - [cache](#)
 -
 -
 -
 - [Schema](#)
- - [/logs/wrapper.log](#)dble
 - [/logs/dble.log](#)dbledble
- -

dble 3.20.07.0 [2.20.04.0](#)

2.

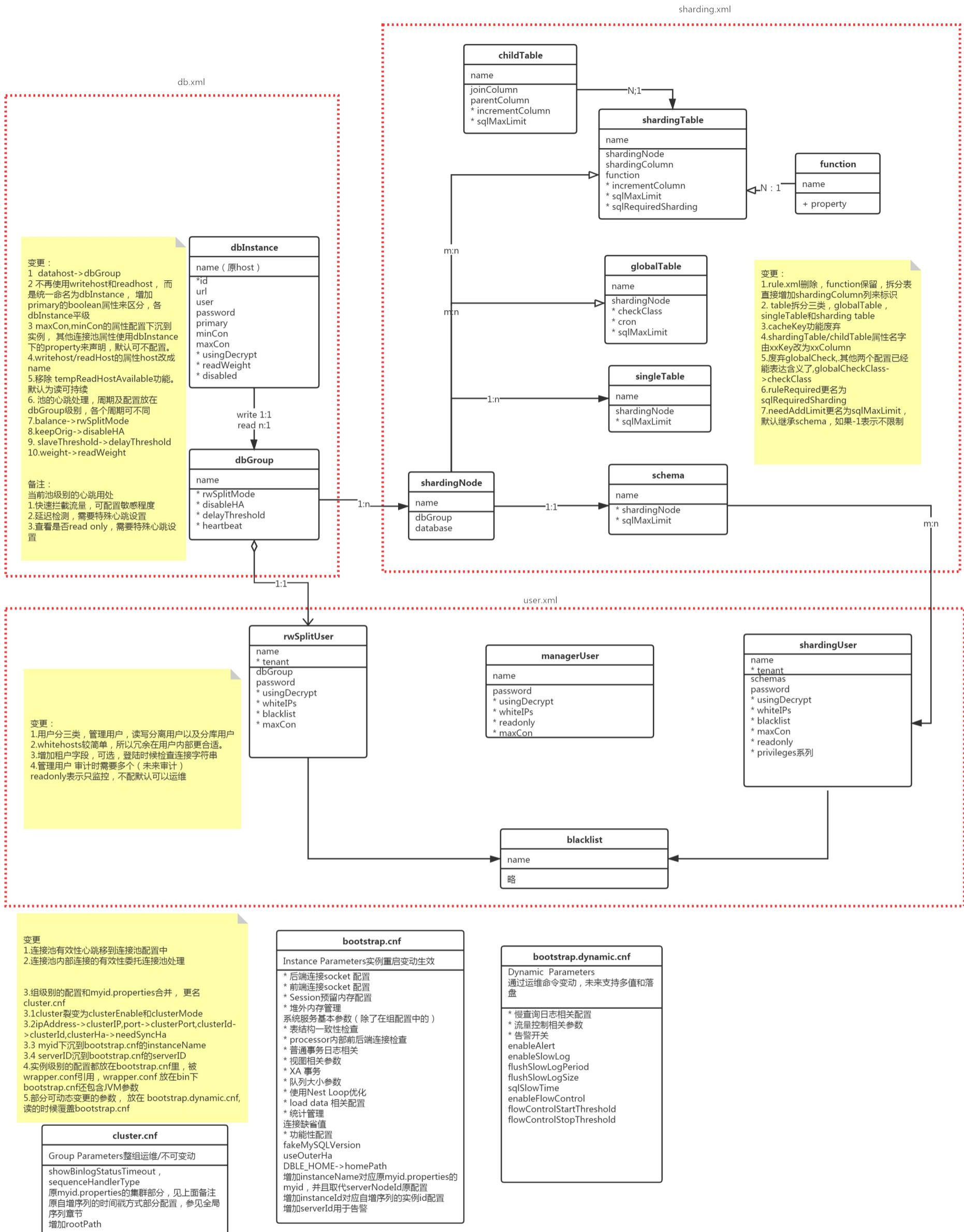
[dble_update_config](#)2.20.04.0 3.20.07.02.20.04.0

```
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)
```

3.



1.1 cluster.cnf

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

	&	/	
clusterEnable		true/falsefalse	clusterIPclusterPortrootPathclusterID
clusterMode		zk/ucoreclusterEnable	zkzookeeperucore
clusterIP	IP	clusterEnable	clusterModezk 10.186.19.aa:2281,10.186.60.bb:2281 clusterModecoreucoreip IP
clusterPort			clusterModezkclusterModeucoreucore
rootPath		clusterEnable	
clusterId	dble	clusterEnable	dbledble
needSyncHa	ha	true/falsefalse	trueuseOuterHatrue
showBinlogStatusTimeout	binlog	60000 ,	binlog
sequenceHandlerType		1~42	1MySQL offset-step sequence 2(Snowflake) 3time(Snowflake) 4offset-step
sequenceStartTime		2010-11-04 09:42:54	sequenceHandlerType23
sequenceInstanceByZk	timezkid	true/false,true	sequenceHandlerType3clusterModezk

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

1.2 bootstrap.cnf

dblewrapper.cnfwrapper

1.2.1 jvm

JVM,

```
-agentlib:jdwp=transport=dt_socket,server=y,address=8088,suspend=n
-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
```

JVM JVM

MaxDirectMemorySize 81917M 79G 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	slowlogsviewConfxa tmxalogsload datatemp	,		,
	instanceName			xa	
	instanceId	id			sequenceHandlerType=2 3.
	serverId		IP	dble	sequenceHandlerType=2 0~1023
	bindIp	IP	"0.0.0.0"	IP	IP, sequenceHandlerType=3 0~511
	serverPort		8066		
	managerPort		9066		
	maxCon		0	maxCon0,maxCon,, maxcon	maxConmanager

	NIOFrontRW	NIOprocessors NIOFrontRWprocessors NIOFrontRW	java ,	IO	
	NIOBackendRW	NIObackendProcessors NIOBackendRW backendProcessors NIOBackendRW	java ,	IO	
	frontWorker	processorExecutor frontWorker processorExecutor frontWorker	(2,)		
	backendWorker	backendProcessorExecutor backendWorker backendProcessorExecutor backendWorker	(2,)		
	complexQueryWorker	complexExecutor complexQuery Worker complexExecutor complexQuery Worker	(2,88		
	writeToBackendWorker	SQL writeToBackendExecutor writeToBackendWorker writeToBackendExecutor writeToBackendWorker	(2,)	SQL	
	fakeMySQLVersion	DbleMysql	NULL	MySql, Mysql, Mysql	MYSQL
	serverBacklog	tcp backlog	2048	tcp backlog	
	usePerformanceMode		0/	DbleCPU,	1-0-
	useOuterHa		true	dble	true/false
	charset		utf8mb4		
	maxPacketSize		4×1024×1024	dble(+1024)dbInstance dbInstance-1024.1024SQL	
	txIsolation		3	SQL dbledbInstancesession sessionSQLsessionset	1- READ_UNCOMMITTED 2-READ_COMMITTED 3-REPEATABLE_READ 4-SERIALIZABLE
	autocommit		1	dbledbInstance sessionSQLsessionset	0/1
	useCompression		0	mysql	1 - 0 -
	capClientFoundRows	Client_Found_Rows	false	dbleClient_Found_Rows	true - false -
	usingAIO	AIO	0	AIONIO	1 - 0 -

	useThreadUsageStat		0/	show @@thread_used	1-0-
	useCostTimeStat		0/	BTraceCostTime.java, show @@cost_time	1-0-
	maxCostStatSize		100	show @@cost_time	
	costSamplePercent		1/%	costSamplePercent	
processor	checkTableConsistency		0	1 DB	1-,0-
	checkTableConsistencyPeriod		30×60×1000 ,		
	sqlExecuteTimeout		300 ,		
processor	idleTimeout		10 × 60 × 1000 ,	processor	
	processorCheckPeriod	processor	1000 ,	processor	
	backSocketSoRcvbuf		1024×1024×4 ,	buffer	
socket	backSocketSoSndbuf		1024×1024 ,	buffer	
	backSocketNoDelay	Nagle	1/		1-, 0-
	frontSocketSoRcvbuf		1024 × 1024 ,		
socket	frontSocketSoSndbuf		1024×1024×4 ,	buffer	
	frontSocketNoDelay	Nagle	1		1-,0-
	orderMemSize	sessionorder	4,M	sessionorder by	
Session	otherMemSize	session	4,M	sessionsubQuerydistinctd	
	joinMemSize	sessionjoin	4M	sessionjoin	
	bufferPoolChunkSize		4096 ,		
	bufferPoolPageNumber		0.8 × MaxDirectMemorySize / bufferPoolPageSize(default 2M)	bufferPoolPageSize	

	bufferPoolPageSize		1024 * 1024 * 2, <i>MaxDirectMemorySize() bufferPoolPageNumber * bufferPoolPageSizeOOM</i>	bufferPoolPageNumbe,	
	mappedFileSize		1024×1024×64 ,	,	
	bufferUsagePercent		80,	resultSetMapClear clearBigSQLResultSetMap Ms	0-100
	useSqlStat	SQL	1/ <i>SQL recycleSqlStat5SQL</i>	SQL	1-0-
	clearBigSQLResultSetMap Ms		600×1000 ,	resultSetMapClear	
	sqlRecordCount		10 ,	recycleSqlStatsql,SQL	
	maxResultSet		512×1024 ,	SQL	
	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 session	
	xaLogCleanPeriod	XALog	1000 ms	server XA log	
	xaRetryCount	XA	0	XA0	
	viewPersistenceConfBaseDir		dble/viewConf	,	

	viewPersistenceConfBaseName		viewJson	,	
join	joinQueueSize	join,	1024		
	mergeQueueSize	merge,	1024		
	orderByQueueSize	,	1024		
join	useJoinStrategy	nest loop		joinwhereSQL	true false
	joinStrategyType	nest loop	-1nestloop	-1useJoinStrategy=true useJoinStrategynestloop 0 nestloop(useJoinStrategy)1 useJoinStrategy(useJoinStrategy),2 alwaysTryNestLoop(useJoinStrategy)	-12
	nestLoopConnSize		4		
	nestLoopRowSize		2000		
	inSubQueryTransformToJoin	injoin	false	indblejoinsql	true false
	enableSlowLog		0		01
	slowLogBaseDir		dble/slowlogs		
	slowLogBaseName		slow-query	(.log)	
	flushSlowLogPeriod		1		
	flushSlowLogSize		1000	1	
	sqlSlowTime		100		0
load data	maxCharsPerColumn		65535		
	maxRowSizeToFile	load data	100000	load dataOOM load data	,
	enableBatchLoadData	load data	0	load datamaxRowSizeToFile	01
	enableFlowControl	true/false	false		true/false
	flowControlStartThreshold		4096		
	flowControlStopThreshold		256		
	enableCursor	server-side-cursor.	false	prepare statement 4.4	true or false
	maxHeapTableSize	,byte	4096		0
	heapTableBufferChunkSize	buffer cache	bufferPoolChunkSize,byte	buffer	bufferPoolChunkSize
	enableGeneralLog	genegral	0	sqlgeneral	0/1

general	generalLogFile	general	general/general.log	'/homepath	
	generalLogFileSize	general	16M	general.logyyyy-MM/general-MM-dd-%d.loglog4j	
	generalLogQueueSize	general	4096	log4jAsyncLogger	2
sql statistic	enableStatistic		false		true false
	associateTablesByEntryByUserTableSize	sql_statistic_by_associate_tables_by_entry_by_user	1024		1
	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	0	samplingRate100dble4 1004	[0,100]
	sqlLogTableSize	sql log	1024		
	rwStickyTime	00	1000(ms), 0()()	SQLSQLrwStickyTime SQL().	

1.2.3 bootstrap.dynamic.cnf

```
bootstrap.dynamic.cnf
enableAlert
enableSlowLog
flushSlowLogPeriod
flushSlowLogSize
sqlSlowTime
enableFlowControl
flowControlStartThreshold
flowControlStopThreshold
enableGeneralLog
generalLogFile
enableStatistic
associateTablesByEntryByUserTableSize
frontendByBackendByEntryByUserTableSize
tableByUserByEntryTableSize
enableBatchLoadData
maxRowSizeToFile
```

1.2.4

```
#encoding=UTF-8
-agentlib:jdwp=transport=dt_socket,server=y,address=8088,suspend=n
-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
 #-DbindIp=0.0.0.0
 #-DserverPort=8066
 #-DmanagerPort=9066
 #-DmaxCon=1024
 #-DNIOFrontRW=4
 #-DNIOBackendRW=12
 #-DfrontWorker=4
 #-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

# 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, he 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=32768
 -DbufferPoolPageNumber=512
 -DbufferPoolPageSize=2097152
 #-DmappedFileSize=2097152

# sql statistics
 # 1 means use SQL statistics, 0 means not
 -DuseSqlStat=1
 #-DbufferUsagePercent=80
 -DclearBigSQLResultSetMapMs=600000
 #-DsqlRecordCount=10
 #-DmaxResultSet=524288

# 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=/xalog/
 # 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
 #-DmaxRowSizeToFile=100000
 if enable the batch load data
 #-DenableBatchLoadData=1
 #enableFlowControl=false
 #flowControlStartThreshold=4096
 #flowControlStopThreshold=256

 # 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
 #-DassociateTablesByEntryByUserTableSize=1024
 #-DfrontendByBackendByEntryByUserTableSize=1024
 #-DttableByUserByEntryTableSize=1024
 # processing queue size must not be less than 1 and must be a power of 2
 #-DstatisticQueueSize=4096
 # samplingRate
 #-DsamplingRate=0
 # size of sql log table
 #-DsqlLogTableSize=1024
 #-DinSubQueryTransformToJoin=false
 #For rwSplitUser, Implement stickiness for read and write instances, the default value is 1000ms
 #-DrwStickyTime=1000

```

1.3 user.xml

1.3.1 XML

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

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

1.3.2 managerUser()

		/	
name		mysql	
password			
usingDecrypt		true/falsefalse	passwordcrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5lOrRU1QRXuLTYt ATUG0fGW2k5kdXUhKL5zf02hE6nGjdnS WrufVkJPUZpbQ2qX9uQ== password fP/nl3XPXrSfWjpQzit5lOrRU1QRXuLTYt ATUG0fGW2k5kdXUhKL5zf02hE6nGjdnS WrufVkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
whiteIPs	ip		whiteIPs
readOnly		true/falsefalse	showselect
maxCon			,0 maxCon

1.3.3 shardingUser()

		/	
name		mysql	
password			
usingDecrypt		true/falsefalse	passwordcrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5lOrRU1QRXuLTYt ATUG0fGW2k5kdXUhKL5zf02hE6nGjdnS WrufVkJPUZpbQ2qX9uQ== password fP/nl3XPXrSfWjpQzit5lOrRU1QRXuLTYt ATUG0fGW2k5kdXUhKL5zf02hE6nGjdnS WrufVkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
whiteIPs	ip		whiteIPs
readOnly		true/falsefalse	DMLshowselect
tenant			tenant
schemas	schema		schemaschemasharding.xmlschma
maxCon			,0 maxConmaxCon
blacklist	blacklist		blacklist
privileges	table		privileges

1.3.3.1 user.privileges.schema

user.privileges schemadml

--	--	--

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

1.3.3.2 user.privileges.schema.table

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

1.3.4 rwSplitUser()

		/	
name		mysql	
password			
usingDecrypt		true/falsefalse	passwordencrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5lIOrRU1QRXuLTYt ATUG0fGW2k5kdXUhKL5zf02hE6nGjdnS WrufVkJPUZpbQ2qX9uQ== password fP/nl3XPXrSfWjpQzit5lIOrRU1QRXuLTYt ATUG0fGW2k5kdXUhKL5zf02hE6nGjdnS WrufVkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
whiteIPs	ip		whiteIPs
tenant			tenant
dbGroup	dbGroup		db.xmldbGroup
maxCon			,0 maxConmaxCon
blacklist	blacklist		blacklist

1.3.5 analysisUser()

		/	
name		clickhouse	
password			passwordencrypt.sh 0:{user}:{password} encrypt.sh 0:xxx:123456 fP/nl3XPXrSfWjpQzit5lIOrRU1QRXuLTYt ATUG0fGW2k5kdXUhKL5zf02hE6nGjdnS WrufVkJPUZpbQ2qX9uQ== password fP/nl3XPXrSfWjpQzit5lIOrRU1QRXuLTYt ATUG0fGW2k5kdXUhKL5zf02hE6nGjdnS WrufVkJPUZpbQ2qX9uQ== user xxx -u xxx -p123456
usingDecrypt		true/falsefalse	

whiteIPs	ip		whiteIPs
tenant			tenant
dbGroup	dbGroup		db.xmldbGroup
maxCon			,0 maxConmaxCon
blacklist	blacklist		blacklist

1.3.6 blacklist()

		/	
name	blacklist		
property			property

1.3.5.1 blacklist.property()

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

keyvalue

selectAllow	select	true	true - false -	querySQLsqlselect	
selectAllColumnAllow		true	true - false -	sqlsql*(x.*)	
selectIntoAllow	select into	true	true - false -	querySQLsqlselect into	Dble
deleteAllow	delete	true	true - false -	deleteSQLsqldelete	
updateAllow	update	true	true - false -	updateSQLsqlupdate	
insertAllow	insert	true	true - false -	insertSQLsqlinsert	
replaceAllow	replace	true	true - false -	replaceSQLsqlreplace	
mergeAllow	merge (mysql)	true	true - false -	merge	Dble
callAllow	call	true	true - false -	querySQLsqlcall	
setAllow	set	true	true - false -	setSQLsqlset	
truncateAllow	truncate	true	true - false -	truncateSQLtruncate	
createTableAllow	create table	true	true - false -	create tableSQLsqlcreatetable	
alterTableAllow	alter table	true	true - false -	alter tableSQLsqlalter table	
dropTableAllow	drop table	true	true - false -	drop tableSQLsqldrop table	
commentAllow	SQL	false	true - false -	SQLSQL	

noneBaseStatementAllow	DDL	false	true - false -	SQLSQLsql	
multiStatementAllow	sql	false	true - false -	sql	Dble
useAllow	use	true	true - false -	useSQLsqluse	
describeAllow	describe	true	true - false -	SQLSQLdescribe	
showAllow	show	true	true - false -	SQLSQLshow	
commitAllow	commit	true	true - false -	commitSQLcommit	
rollbackAllow	rollback	true	true - false -	rollbackSQLrollback	Dble
selectWhereAlwaysTrueCheck	select where	true	true - false -	1where 2SQL() 3SQL select * from test where id = id and hujh = hujh/*lxxdffsgdfsfdqwesfct*/;	
selectHavingAlwaysTrueCheck	select having	true	true - false -	1having 2SQL() 3SQL select * from test having id = id and hujh = hujh /*lxxdffsgdfsfdqwesfct*/;	
deleteWhereAlwaysTrueCheck	delete	true	true - false -	delete,sqlwheredelete from suntest where id = id and name= name /*sdfaasdf*/;	
deleteWhereNoneCheck	deletewhere	false	true - false -	deletedelete from suntest;	
updateWhereAlwaysTrueCheck	delete	true	true - false -	deletesqlwherupdate suntest set name = '33' where id = id,name = name /*sdfsdf*/;	
updateWhereNoneCheck	updatewhere	false	true - false -	updateupdate suntest set name = '33';	
conditionAndAlwaysTrueAllow	and true	false	true - false -	whereand:select * from suntest where id = 567 and 1 = 1;	
conditionAndAlwaysFalseAllow	and false	false	true - false -	whereand:select * from suntest where id = 567 and 1 != 1;	
conditionLikeTrueAllow	like	true	true - false -	SQLsqllike '%'	dble
selectIntoOutfileAllow	SELECT ... INTO OUTFILE	false	true - false -	querySQLSELECT ... INTO OUTFILE	Dble
selectUnionCheck	union check	true	true - false -	unoin select * from sbtest1 unoin select * from suntest;	druid bug
				MINUS	

selectMinusCheck	MINUS check	true	true - false -	left sqlfromright from select * from sbtest1 where namec = 'fff' minus select * from dual;	mysql
selectExceptCheck	except check	true	true - false -	except left sqlfromright from select * from sbtest1 where name = 'ff' except select * from dual;	mysql
selectIntersectCheck	intersect check	true	true - false -	INTERSECT left sqlfromright from :select * from sbtest1 where name = 'ff' INTERSECT select * from dual;	mysql
mustParameterized		false	true - false -	SQLSQL name = 'sdfasdf' ,id = 1	
strictSyntaxCheck		true	true - false -	Druid SQL ParserSQL	
conditionOpXorAllow	SQLXOR	false	true - false -	SQLSQL	
conditionOpBitwiseAllow	"&" "~"" ""^""	true	true - false -	SQLSQL	
conditionDoubleConstAllow		false	true - false -	SQLselect * from suntest asdf where 1 = 1 and 2 = 1;	
minusAllow	minus	true	true - false -	minusSQLminus	
intersectAllow	intersect	true	true - false -	intersectSQLintersect	
constArithmeticAllow		true	true - false -	SQLselect * from suntest asdf where id = 2 -1;	
limitZeroAllow	limit 0	false	true - false -	SQLSQLlimit 0	
selectLimit	limit	-1	-1	selectselect	Dble
startTransactionAllow	START TRANSACTION	true	true - false -	START TRANSACTION SQLSTART TRANSACTION	
lockTableAllow	lock tables	true	true - false -	lock tablesSQLlock	
hintAllow	sql hint	true	true - false -	sqlSQLSQLhint	
blockAllow		true	true - false -	SQLSQLSQL BEGIN; select * from suntest;END;//	
renameTableAllow	rename table	true	true - false -	rename tableSQLsqlrename table	ble
completeInsertValuesCheck	dble1.0.311.2.6	false	true - false -	druidflagdble	
caseConditionConstAllow			true -	SQL	

caseConditionConstAllow		false	false -	:delete from suntest where id = 123 and 'name' = (selectcase 'fname' when dsome' else 'good' end from xtest) /*sdfaasdf*/;
doPrivilegedAllow	druid	false	true - false -	druidflagdble
tableCheck	table	true	true - false -	druidble
schemaCheck	schema	true	true - false -	druidble
functionCheck	function	true	true - false -	druidble
objectCheck	object	true	true - false -	druidble
variantCheck		true	true - false -	druidble
readOnlyTables		-		SELECT INTO DELETE UPDATE INSERT MERGE
metadataAllow	getmetadata	true	true - false -	druidflagdble
wrapAllow	isWrapForunwrap	true	true - false -	druidflagdble

1.3.6 tenant

dble

1. ::

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

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

2. JDBC-connectionAttributes connectionAttributes tenant

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

1/21

1.3.7 whiteIPsIP

IP

ip 192.168.1.2, 192.168.2.22
 IP 192.168.1.10-192.168.1.100
 192.168.1.%
 IP/CIDR 192.168.1.1/20

IPV4/IPV6

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

1.3.8

```
<?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/KBsZqKhT8qSz18Aj91e81x049BKQE1C60FFw4c38pCYa8QGFTub7pnw==" />

  <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"/>
      </schema>
    </privileges>
  </shardingUser>
</dble:user>
```

```
<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"/>
<blacklist name="blacklist1">
    <property name="selectAllow">true</property>
</blacklist>
</db1e:user>
```

1.4 db.xml

db.xml,

1.4.1 dbGroup

- dbGroup

	&	/	
name			dbGroup
rwSplitMode		0/1/2/3	0, 1 2 3
delayThreshold		-1	1:delayThresholdshow slave status 2:delayThreshold=-1
disableHA		true/falsefalse	
heartbeat	,		mysql. : 1.select 1 2. select @@read_only 3.show slave status, Seconds_Behind_Mastermysql
dbInstance			

- heartbeat

	&	/	
timeout	heartbeat,	0	dble heartbeatPeriodMillis dbInstance ,timeout (heartbeatPeriodMillis)22s4s4s timeout(2. dbTimeout
errorRetryCount	heartbeat,	10	,/errorRetryCount 1. errorOK() 2. okError 3.

- dbInstance

	&	/	
name			
id	id	name	id
url	ip:port		IPPORT
user			
password			
usingDecrypt	password	false/true,false	truepasswordencrypt.sh 1:{name}:{user}: {password}
minCon			minCondGroup shardingNode numOfShardingNodes minCon numOfShardingNodes numOfShardingNodes
maxCon			maxCondGroup shardingNode numOfShardingNodes, minCon maxCon numOfShardingNodes minCon ,
readWeight	0		0 0. 0
primary	true	false	
disabled		false	
databaseType		,mysql	mysqlmysqlclickhouseclickhouse, mysqlshardingUserrwSplitUserclickhouse analysisUser, dbGroup dbInstance databaseType
property			

- property

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

```

<dbGroup name="dbGroup1" rwSplitMode="1" delayThreshold="100">
    <heartbeat errorRetryCount="1" timeout="10">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>
</db:db>

```

1.4.2 MySQL

dble MySQL

SELECT	
INSERT	
UPDATE	
DELETE	
FILE	load data
CREATE	0
DROP	
ALTER	
LOCK TABLES	lock tables
ALTER ROUTINE	(hint)/
CREATE ROUTINE	(hint)
EXECUTE	(hint)
INDEX	/
SUPER	KILL
SHOW DATABASES	GUINFORMATION_SCHEMA SCHEMATA
PROCESS	show processlist
REPLICATION CLIENT	: 1., 2.show slave status 3.show @@binlog_status
REFERENCES	0

1.5 sharding.xml

1.5.1 XML

- schema (schema)
- shardingNode ()
- function ()

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

1.5.2 schema

1.5.3 schema

- schema

		/	
name	schema		schema
shardingNode			xmltable 1tableschema 2schematabledefault single table 3(function)schematabledefault sharding table1.13 Schema
function	sharding table		function(shardingNodefunction)1.13 Schema
sqlMaxLimit		-1	SQL 1 (order/group/) 2 schemasqlMaxLimit
shardingTable	shardingTable		
globalTable	globalTable		
singleTable	singleTable		

- shardingTable

		/	
name			,
shardingNode			xxx\$ n_0-n_1 xxxn0, ..., xxxnm, ..., xxxn1 dn\$1-6 dn1,dn2, dn3,dn4,dn5,dn6
shardingColumn			
function			function
incrementColumn			
sqlMaxLimit		schemasqlMaxLimit	schemas schema
sqlRequiredSharding	sql	false	truesql
childTable	childTable		ER

- childTable

		/	
name			,
joinColumn	joinjoin		
parentColumn	joinjoin		/
incrementColumn			
sqlMaxLimit		schemasqlMaxLimit	schemas schema
childTable	childTable		ER

- globalTable

		/	
name			,
shardingNode			xxx\$ n_0-n_1 xxxn0, ..., xxxnm, ..., xxxn1 dn\$1-6 dn1,dn2, dn3,dn4,dn5,dn6
sqlMaxLimit		schemasqlMaxLimit	schemas schema
checkClass			dbleCHECKSUMCOUNT
			quartz http://www.quartz-scheduler.org/api/2.4.0-

- singleTable

		/	
name			,
shardingNode			shardingNode
sqlMaxLimit	schemasqlMaxLimit		schemas schema

1.5.4 shardingNode

- shardingNode

	&	
name	"dn, dn\$0-5"	, ',', X()05,"X\$0-5",\$namedatabase\$group
database	shardingNode my sql schema,"db, db\$0-5"	, ',', X()05,"X\$0-5",\$
dbGroup	shardingNode db.xml dbGroup,, "dh, dh\$0-5"	Host, ',', X()05,"X\$0-5",\$

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

name, dbGroup, database xxx\$n0-n1, xxx, xxnn0... , xxnm ... ,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)dbGroup database,,name20,dbGroup 10,database2;

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

,name22,dbGroup 11,database2

shardingNode dbGroup(shardingNode)

1.5.5 function

name: class property name

- function

name		
class		Enum, NumberRange, Hash, StringHash, Date, PatternRange, jump StringHash
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 + ... + 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. partitionLength1hashM NpartitionCount
 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.

2.

a.l

b. n.

r	r>0	r	r>length	r=length
r	r<=0	r=r+length		r

length.

3.

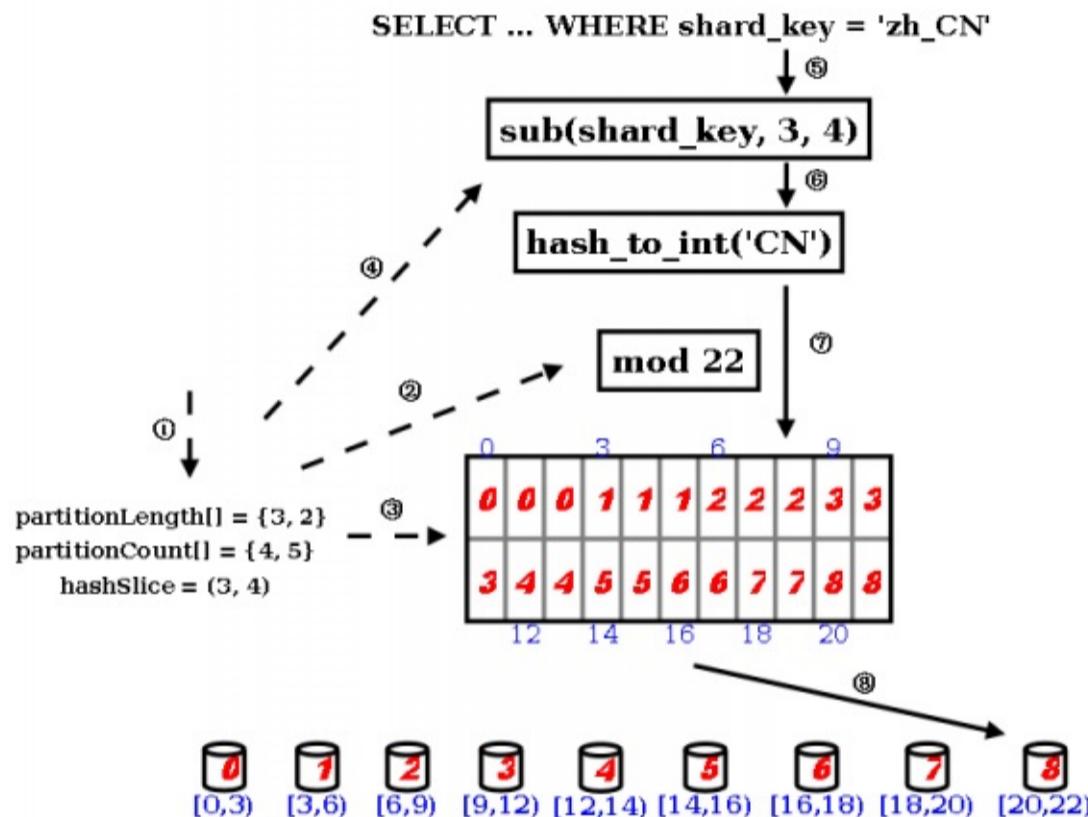
		hash
l<r	[l, r)	hash
l>=r		0

hash hashhashhash

1. hash(3

2.

stringhash unicode hash



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

1.5.5.3.enum

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

```

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

```

mapFile: defaultNode-1 type typekey0 0

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 ...

numberrangepatternValue numberrange

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 sBeginDate defaultNodedefaultNode, 2sEndDate"" sBeginDate sPartitionDaysEndDate N sEndDate
1sEndDateindex=((key - sBeginDate)/sPartitionDay)%N, key index sBeginDate defaultNodedefaultNode;

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"jump stringhash""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.
-->

<dbe:sharding xmlns:dbe="http://dbe.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"/>
    <!--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" />
    <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"/>
    <!--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"/>
            <childTable name="tb_grandson2" joinColumn="grandson2_id" parentColumn="child1_id2"/>
        </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 than 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 than 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>
</function>
```

```
<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 error(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 error
-->
<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)*sPartitionDay-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>
</db:sharding>
```

1.6 log4j2.xml

1.6.1

Dblejavalog4j2.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 [%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>
    </Appenders>
    <Loggers>
        <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

MySQLdb

bleID

mysql

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

dbleupdate(replace)

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

...

schemaXdbble

tableX dbledble

nodeX

1.7.1.2

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

nodeX

a. mysql**nodeX**

mysql ...

b. **nodeXdb(1.5 sharding.xml)**

use db;

c. dbsql.sqldbseq.sql1.7.1.3

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(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.cnfinstanceIdinstance id [0,1023]
cluster.cnfsequenceStartTime YYYY-MM-dd HH:mm:ss 2010-10-04 09:42:54
bootstrap.cnfinstanceIdddble
bigint63
```

1.7.3

```
bootstrap.cnf cluster.cnf

bootstrap.cnfinstanceIdinstance id [0,511]   cluster.cnfsequenceInstanceByZktrueidzk

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

1. cluster.cnfsequenceInstanceByZktruezookeeper([1.1 cluster.cnf](#))
2. **bootstrap.cnfinstanceId**ble
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
- map db 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_typecacheehcacheleveldbmap db rocksdbcache cache

,

factory.encache=ehcache

pool.SQLRouteCache=encache,10000,1800

pool.ER_SQL2PARENTID=encache,1000,1800

typeehcache

factory.encache=ehcache

factory.leveldb=leveldb

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

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

typeencacheleveldb

c. pool.SQLRouteCache=**type,max_size,expire_seconds**spool.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="100000000" maxBytesLocalDisk="50G" updateCheck="false">
    <defaultCache maxElementsInMemory="1000000" eternal="false" overflowToDisk="false" diskSpoolBufferSizeMB="30" maxElementsOnDisk="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**

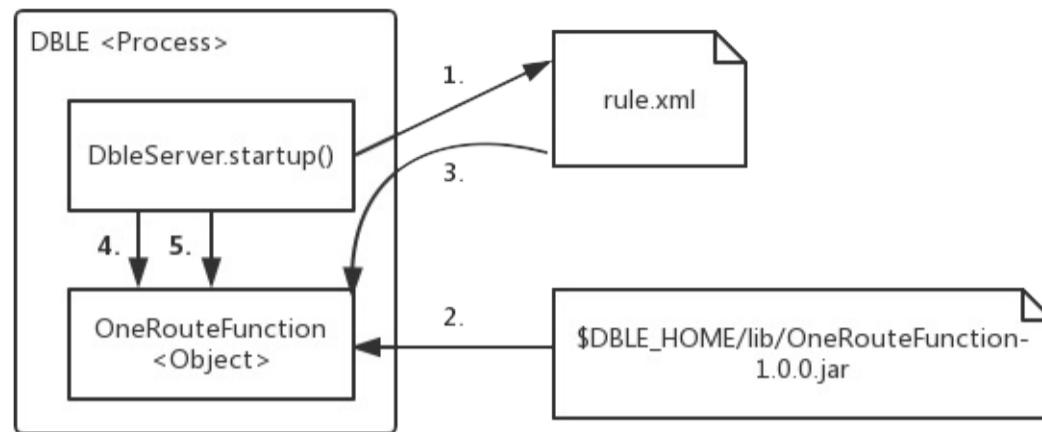
4.dbledefaultCachecache

1.9

1.9.1

1.9.1.1

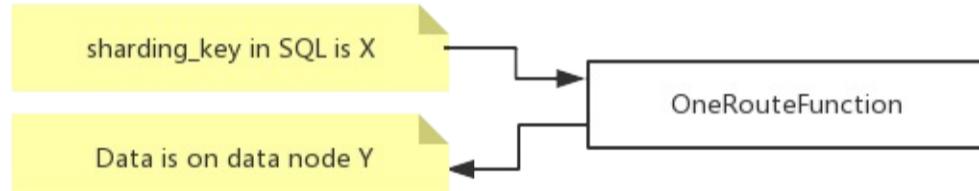
dble



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

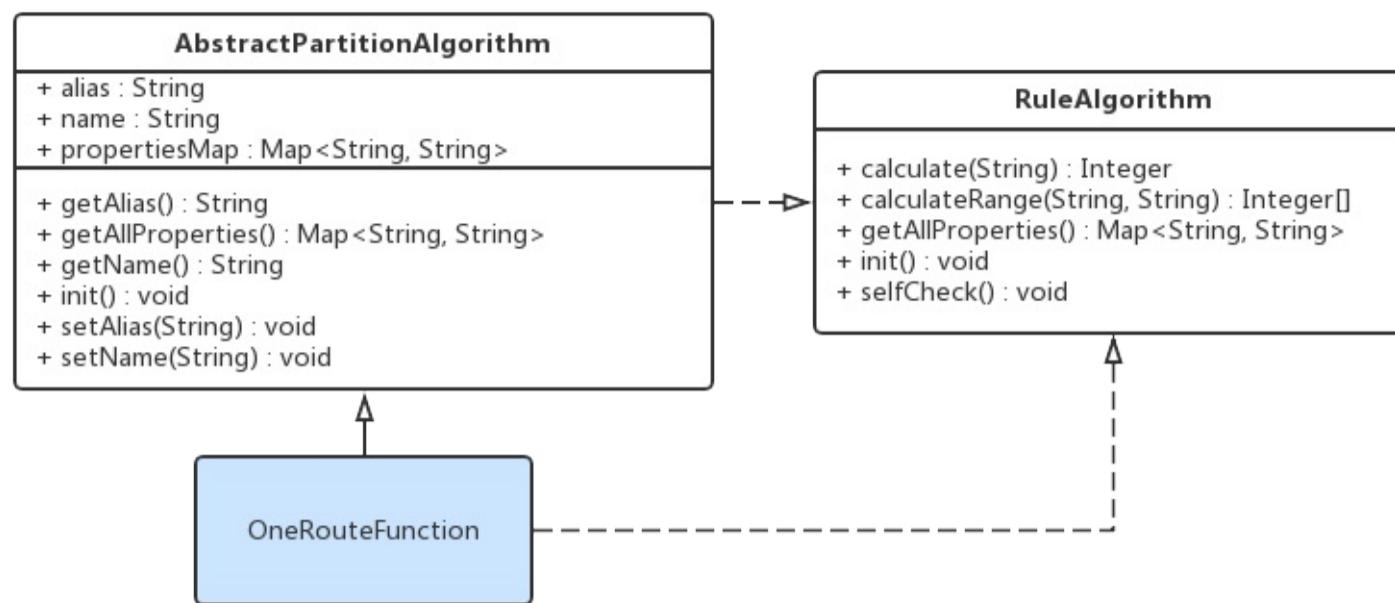
jar classlibraryjarclass

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()

dbleSQLSQLcalculate()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.functions.sharding.xmlXMLLoader7

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

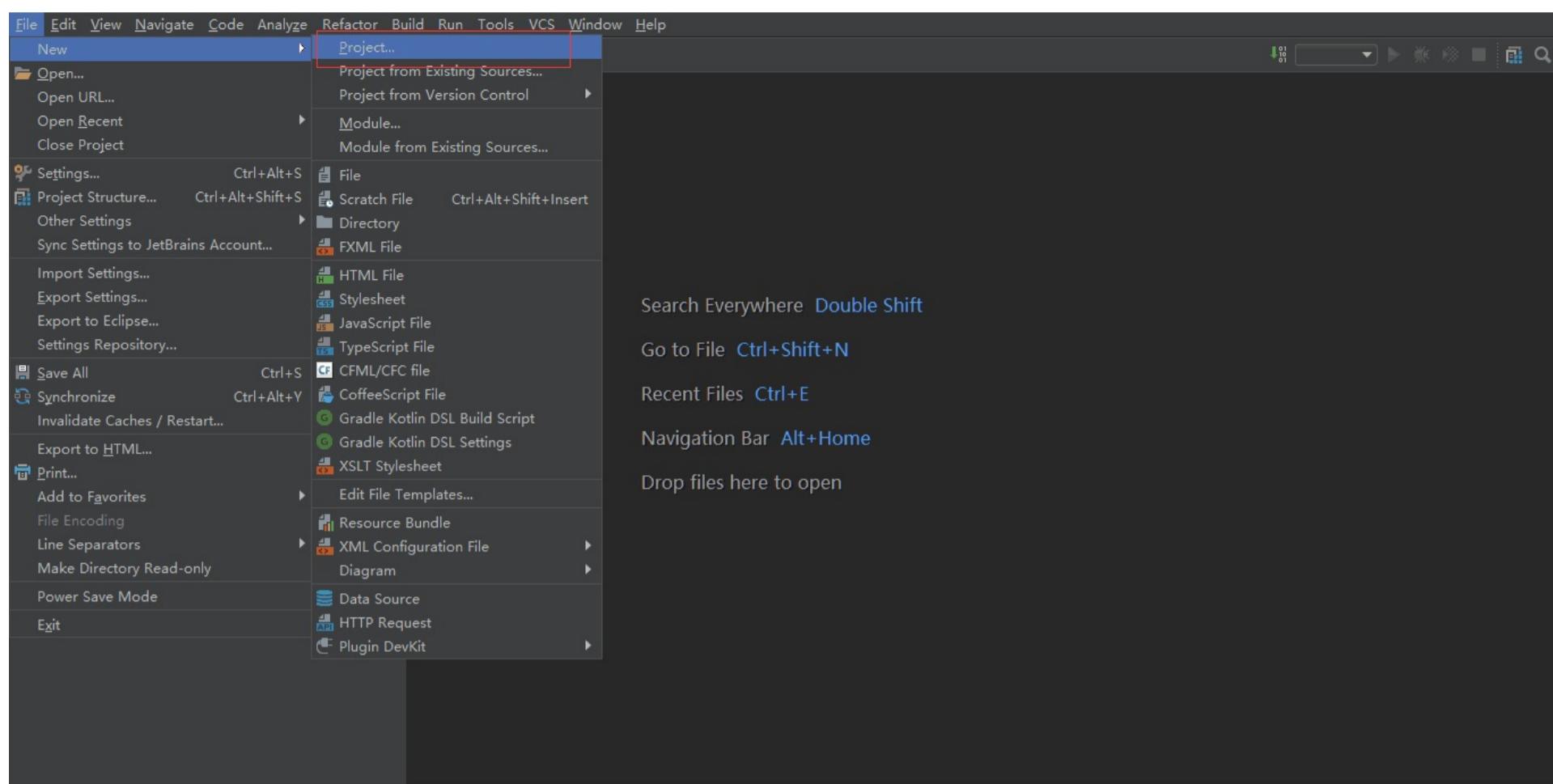
1.9.5 IntelliJ IDEA

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.gz>

1.9.5.1 java

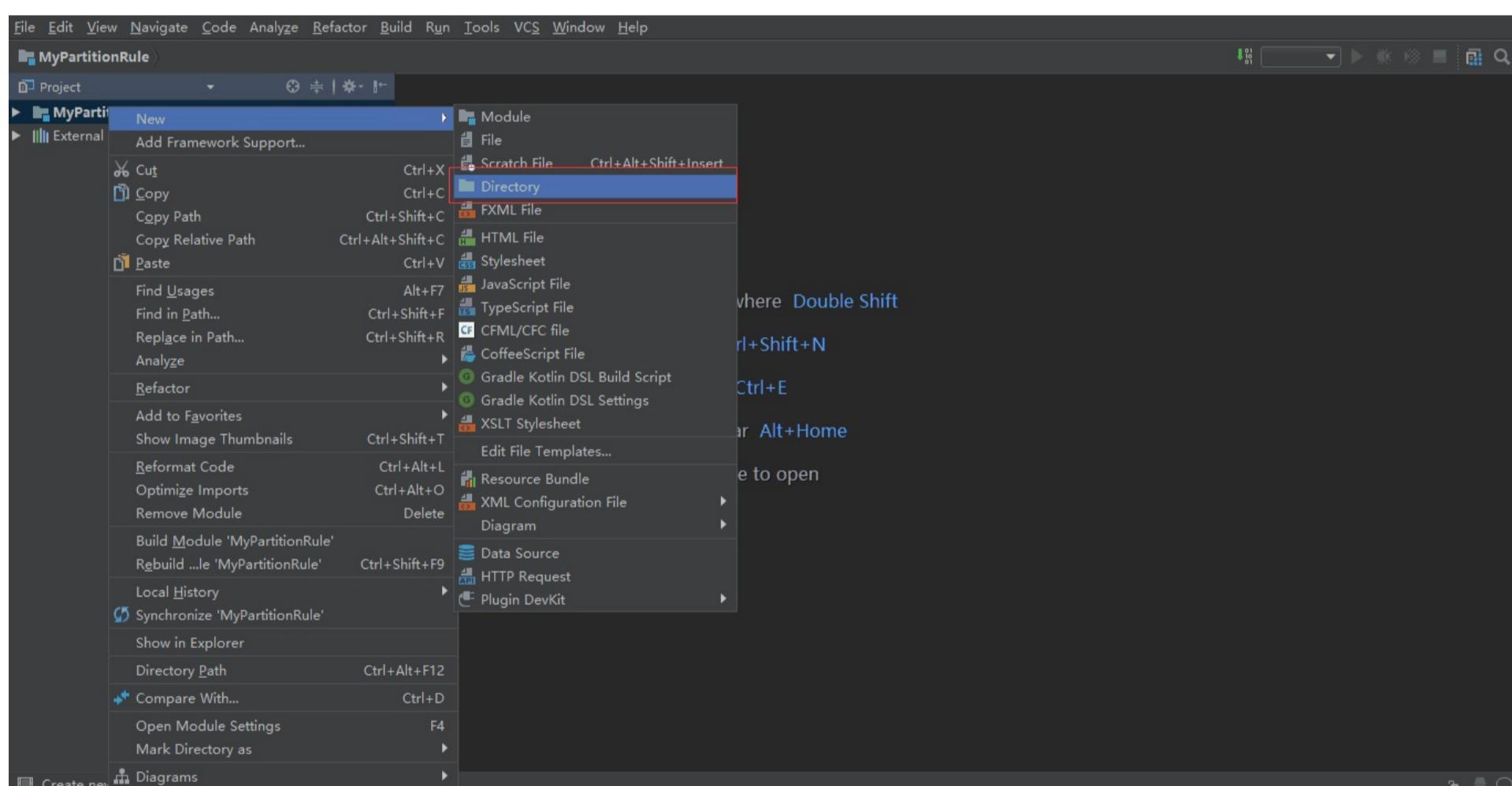
javaProject



Projectjavanext

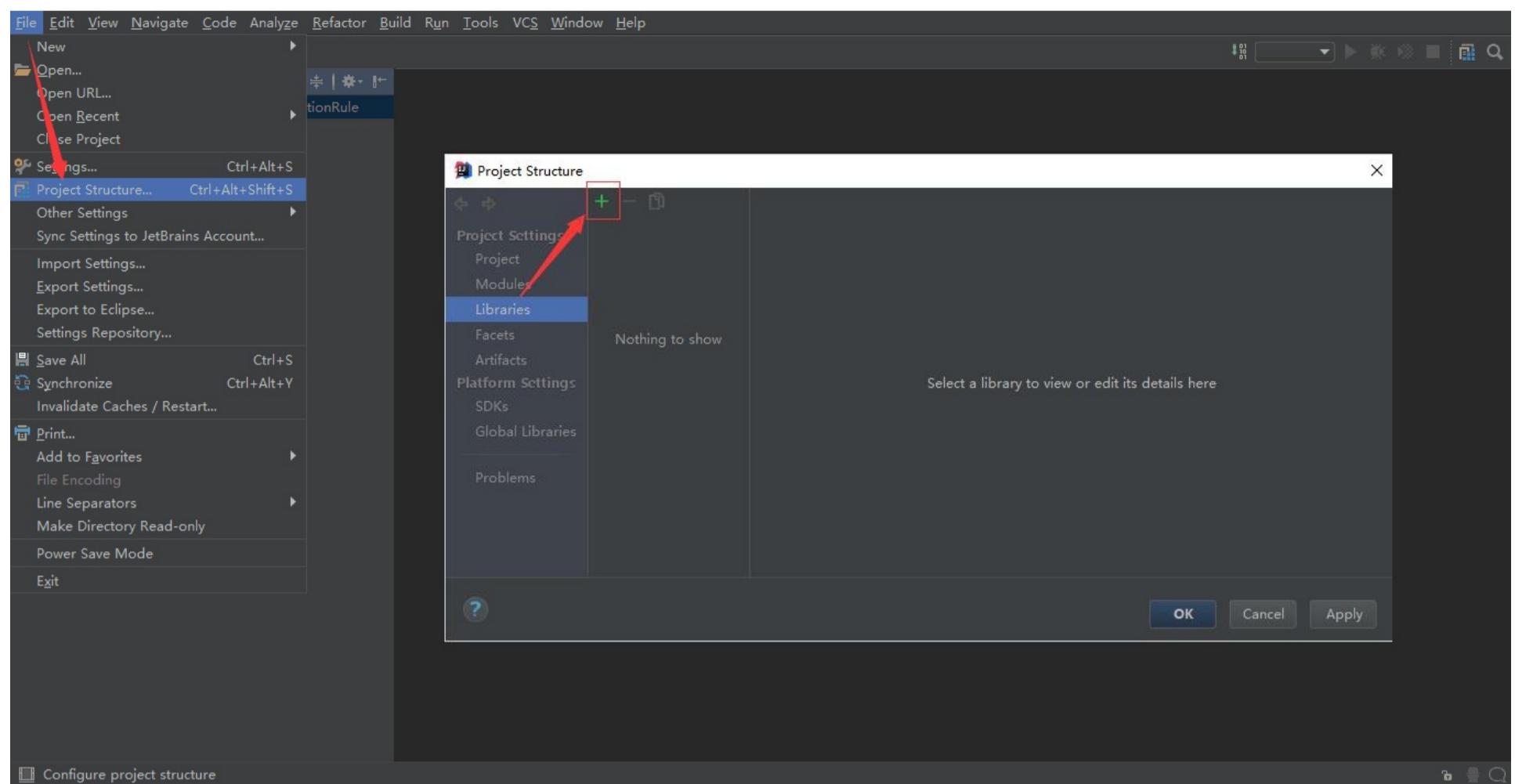
1.9.5.2 dble jar

javalib



dble jarlib

libdble jar

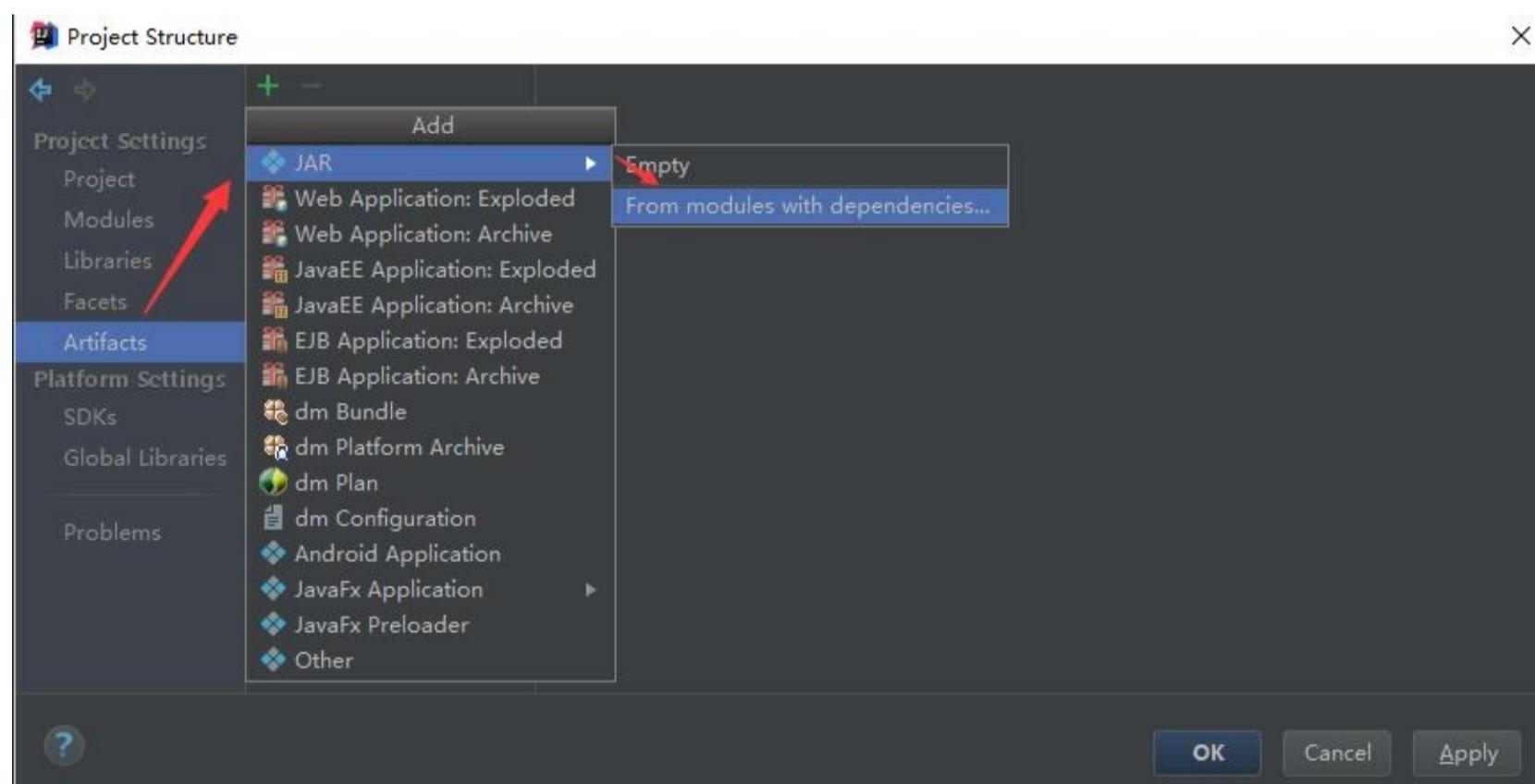


lib

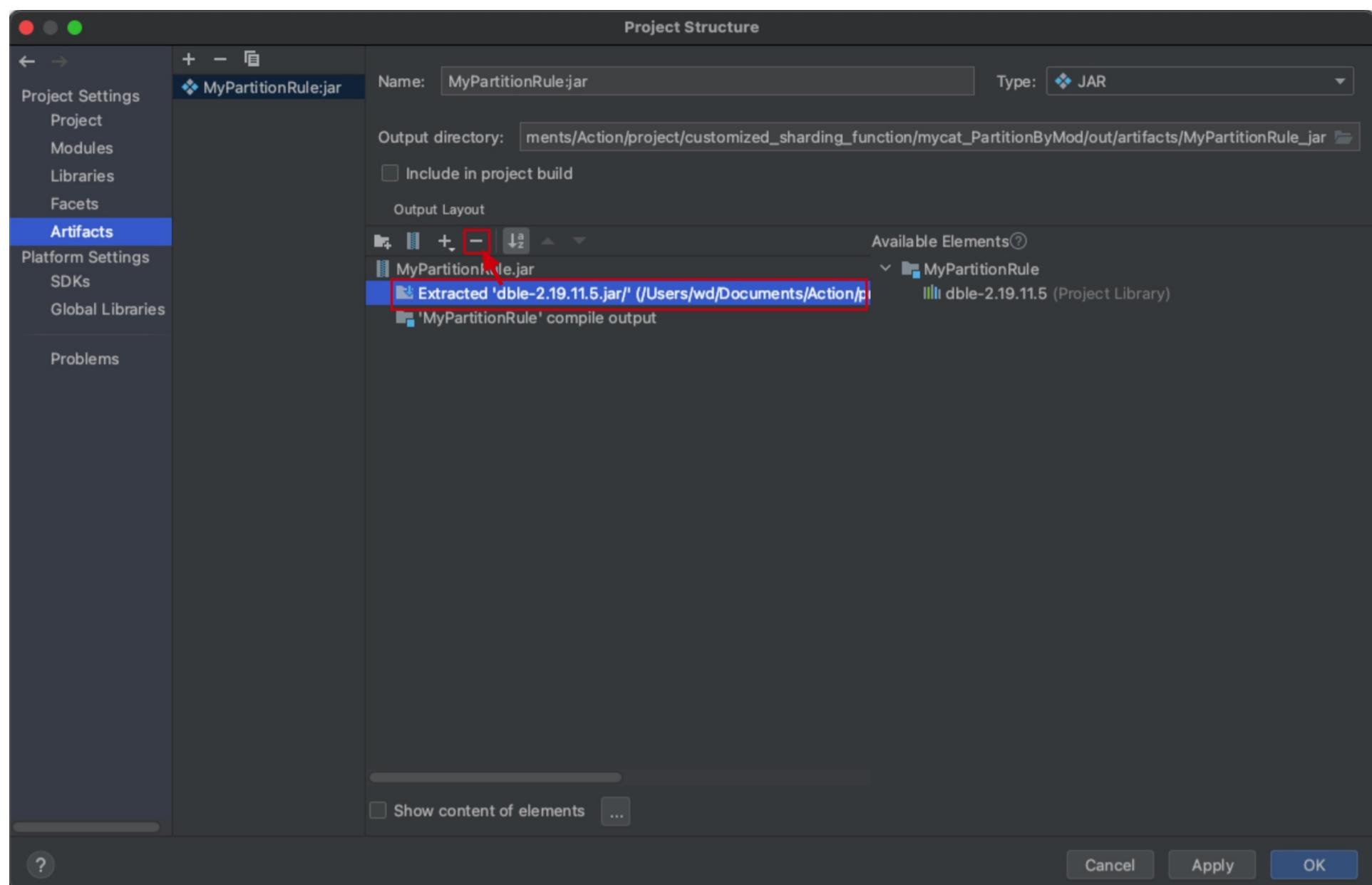
1.9.5.3

1.9.5.4 Artifacts

Project StructureArtifactsOK

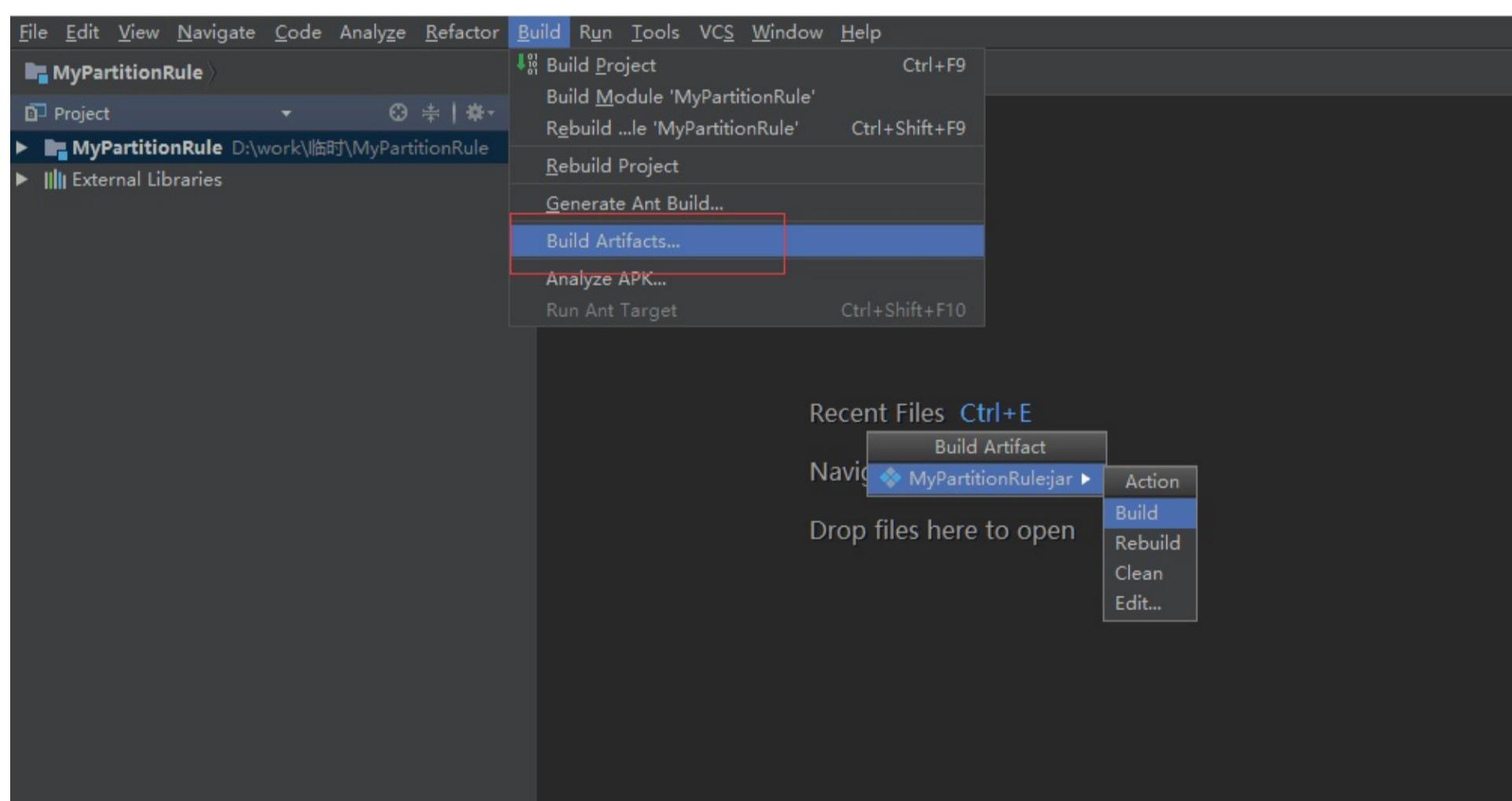


1.9.5.5 Artifactsdble jardble jarApply/ok



1.9.5.6 jar

Build Build Artifacts Artifact build



outartifactjar

1.10

- [3.22.01.0](#)
 - [dble_db_instance](#)
- [3.21.06.0](#)
 -
 -
 -
 - [dble_thread_pool](#)
- [3.21.02.0](#)
 - [sequence](#)
 -
 -
- [3.20.07.0](#)
 -

3.22.01.0

1

BusinessExecutorfrontWorkerbackendBusinessExecutorbackendWorkercomplexQueryExecutorcomplexQuery Worker writeToBackendExecutorwriteToBackendWorker
 BusinessExecutor00-frontWorkerbackendBusinessExecutor00-backendWorker writeToBackendExecutor00-writeToBackendWorker\$_NIO_REACTOR_FRONT-00-NIOFrontRW
 \$_NIO_REACTOR_BACKEND-00-NIOBackendRW

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

2 dble_db_instance

- database_typedbInstance

3.21.06.0

1 dble

1.1 bootstrap.cnf

	inSubQueryTransformToJoininjoin	3.21.06
	enableCursor false	3.21.06

inSubQueryTransformToJoin

```
sqlinjoindbeinjoin
injoininjoinbootstrap.cnf-DinSubQuery TransformToJoin=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
}
```

dblle /{rootPath}/{clusterId} "clusterId

rootPathclusterId cluster.cnf

dble "you may use old incompatible metadata."

3

1. log @@[file=logname limit=numberOfRow key=key word 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 -valuekey value`

```
zksequencekey -valuekey valueon
```

sequence(rootPath/clusterId/conf/sequences) ZK

2 dble

3.21.02.Odblexml

dtdxmlDocumentBuilderxml

xsdxmldbljaxb2.0.xml

smallb small

3 dble

3.1 bootstrap.cnf

	homePath	3.21.02	bootstrap.cnf homePath-DhomePath=.

3.20.07.0

1

dble 3.20.07.0 2.20.04.0

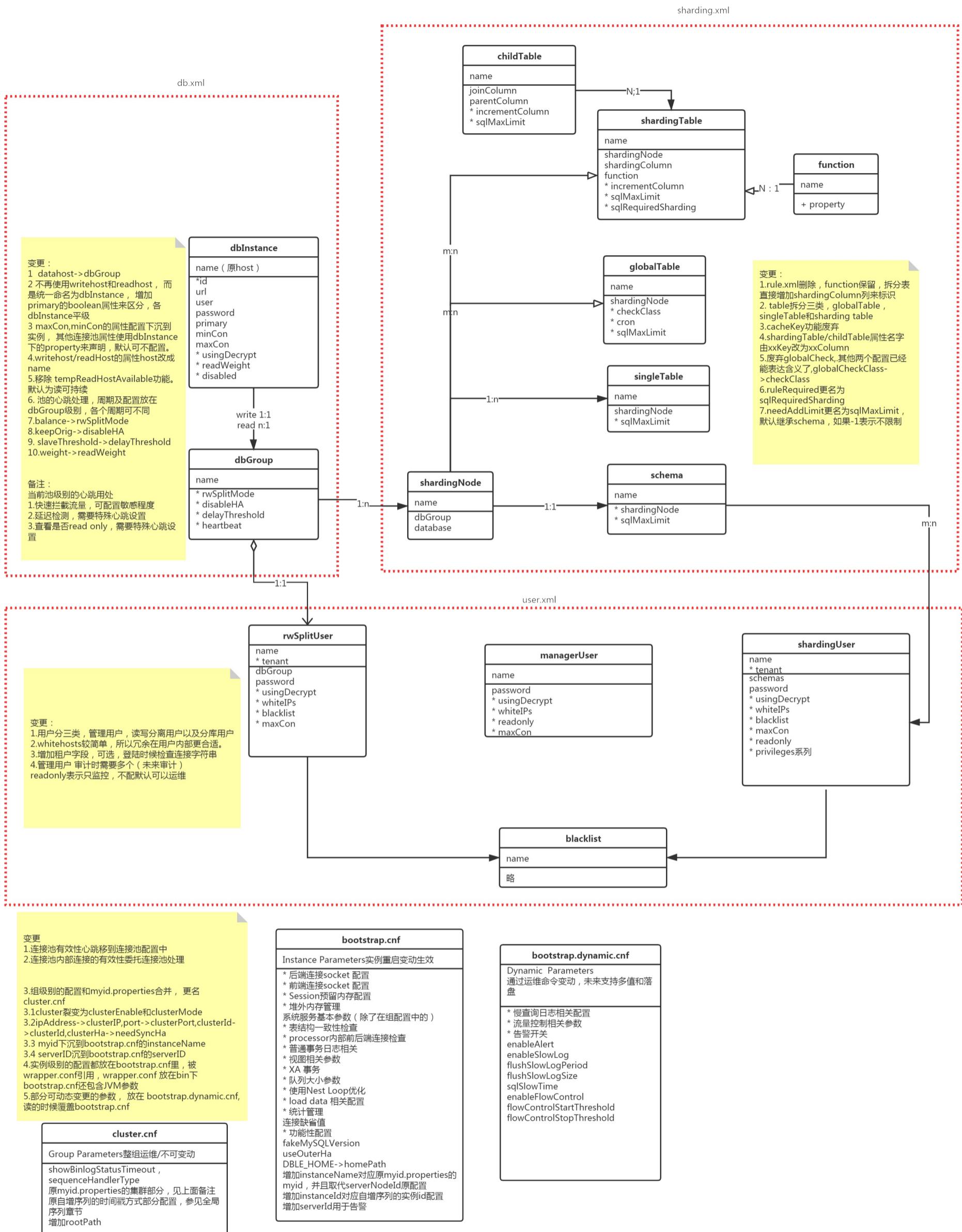
dble_update_config2 20 04 0 3 20 07 02 20 04 0

dble update config [-i=read_dir] [-o=write_dir] [-p=rootPath]

```
read_dir/write_dir: rootPath:zk,          /db1e , ucore,      universe/db1e  
:  
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)
```

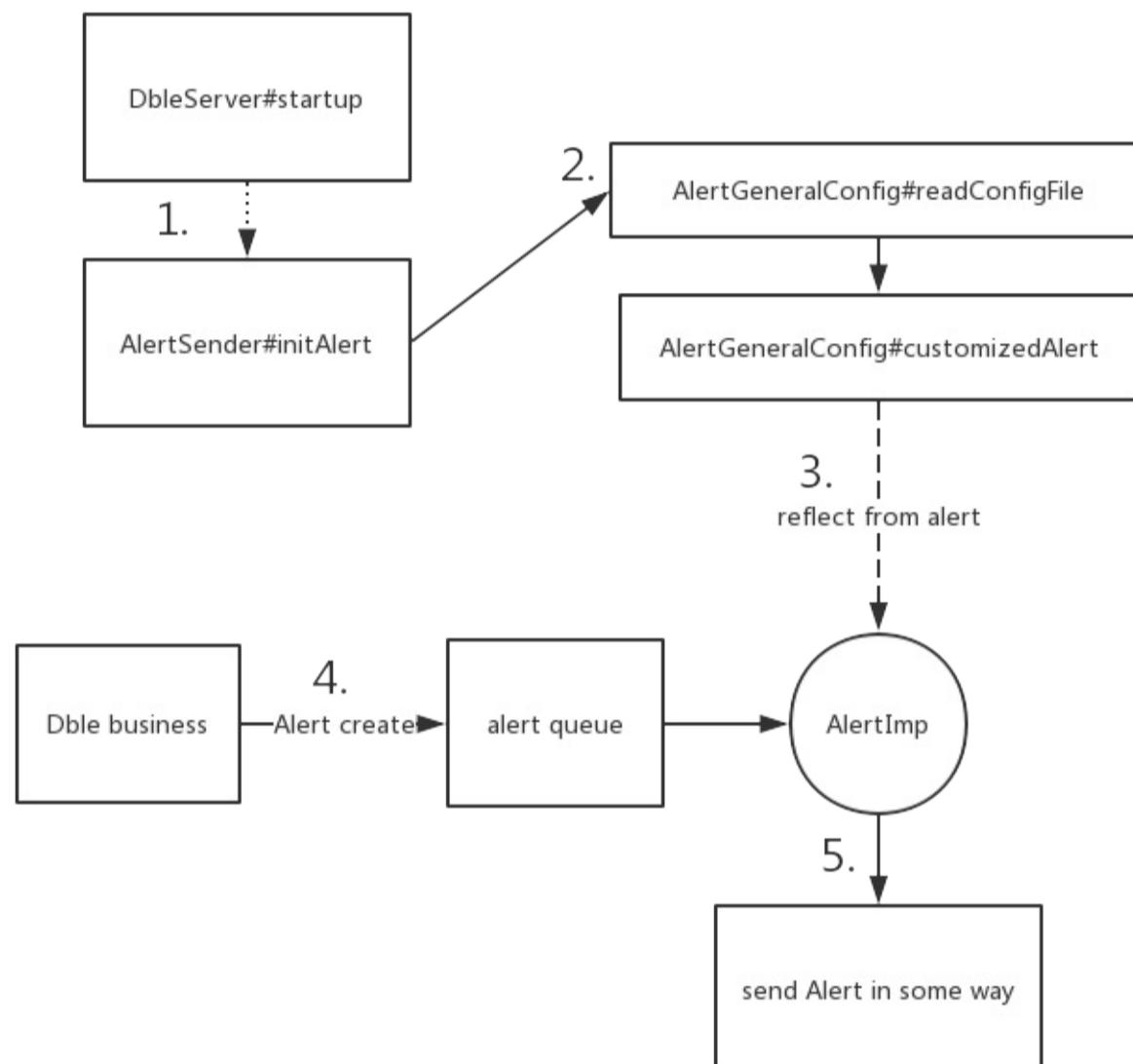


1.11

- -
 -
 - 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

“dble”dblekill “dble”dble

dble

- -dble

- -dble
 - -dble
 - -dble

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

alert alert Selfalert ClusterAlert Beanalert Comp onentTy p alert Comp onent Ialert SelfDBLEserverAlert alert Resolvealert SelfResolve

1.11.1.4

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

dble

1.11.2

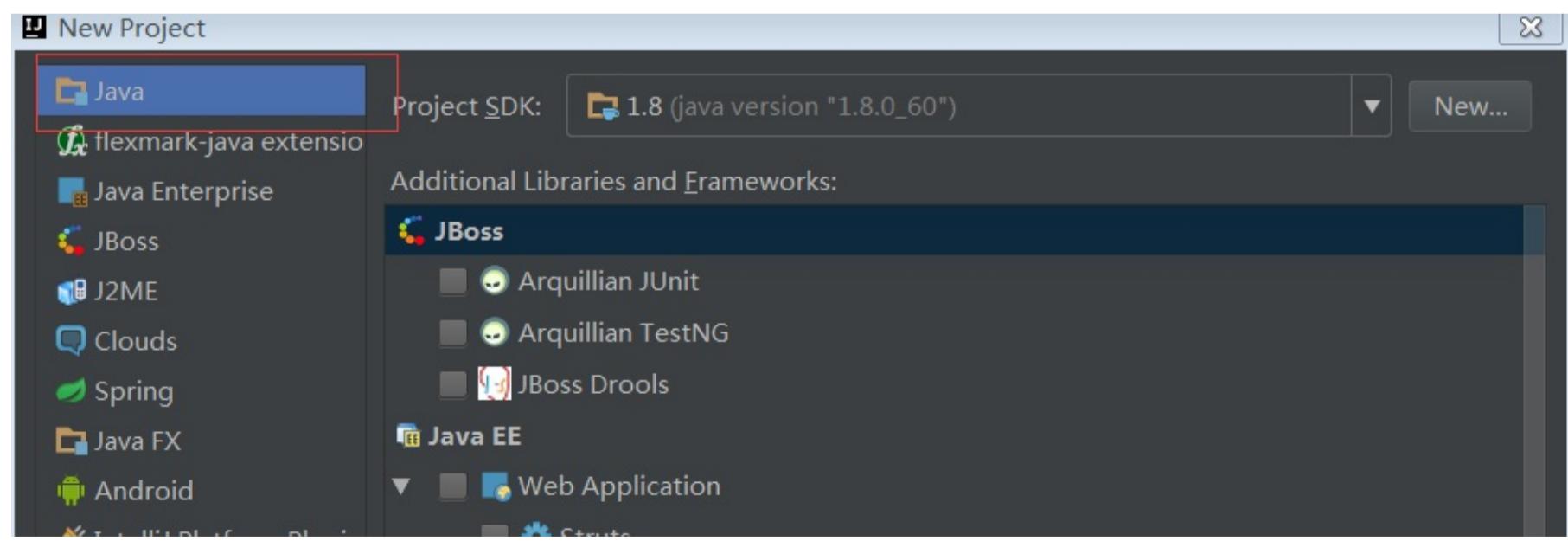
1.11.2.1

dbledble

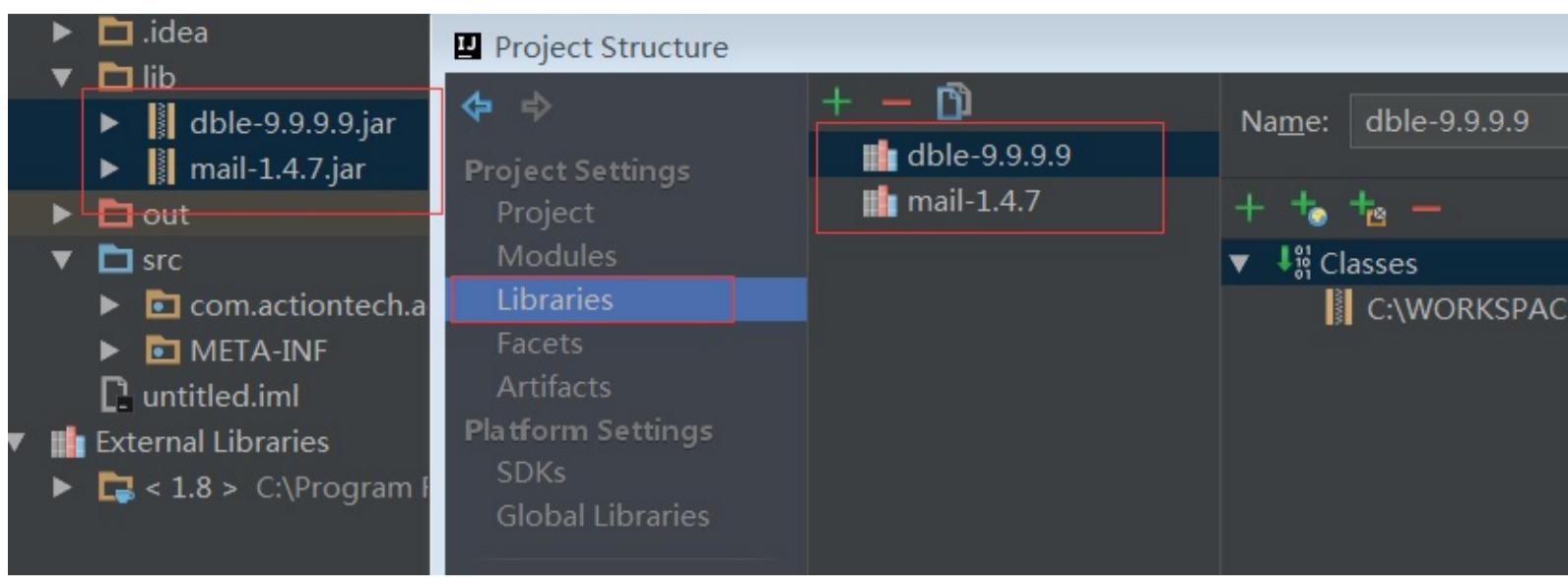
dbl -----Alert

IDEA

1 java



111



javamailjar

3.1 Alert

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

AlertMailAlertAlertGeneralConfig.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(EMAIL_SENDER) == null
        || properties.getProperty(SENDER_PASSWORD) == null
        || properties.getProperty(MAIL_SERVER) == null
        || properties.getProperty(EMAIL_RECEIVE) == null) {
        throw new ConfigException("alert check error, for some config is missing");
    }
}
```

dble_alert.propertiesMAIL_SENTERSENDER_PASSWORDMAIL_SERVERMAIL_RECEIVE dble

properties.getProperty(EMAIL_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(EMAIL_SENDER)));

        Transport transport = session.getTransport();
        transport.connect(properties.getProperty(MAIL_SERVER), properties.getProperty(EMAIL_SENDER), properties.getProperty(SENDER_PASSWORD));

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

3.4

```

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

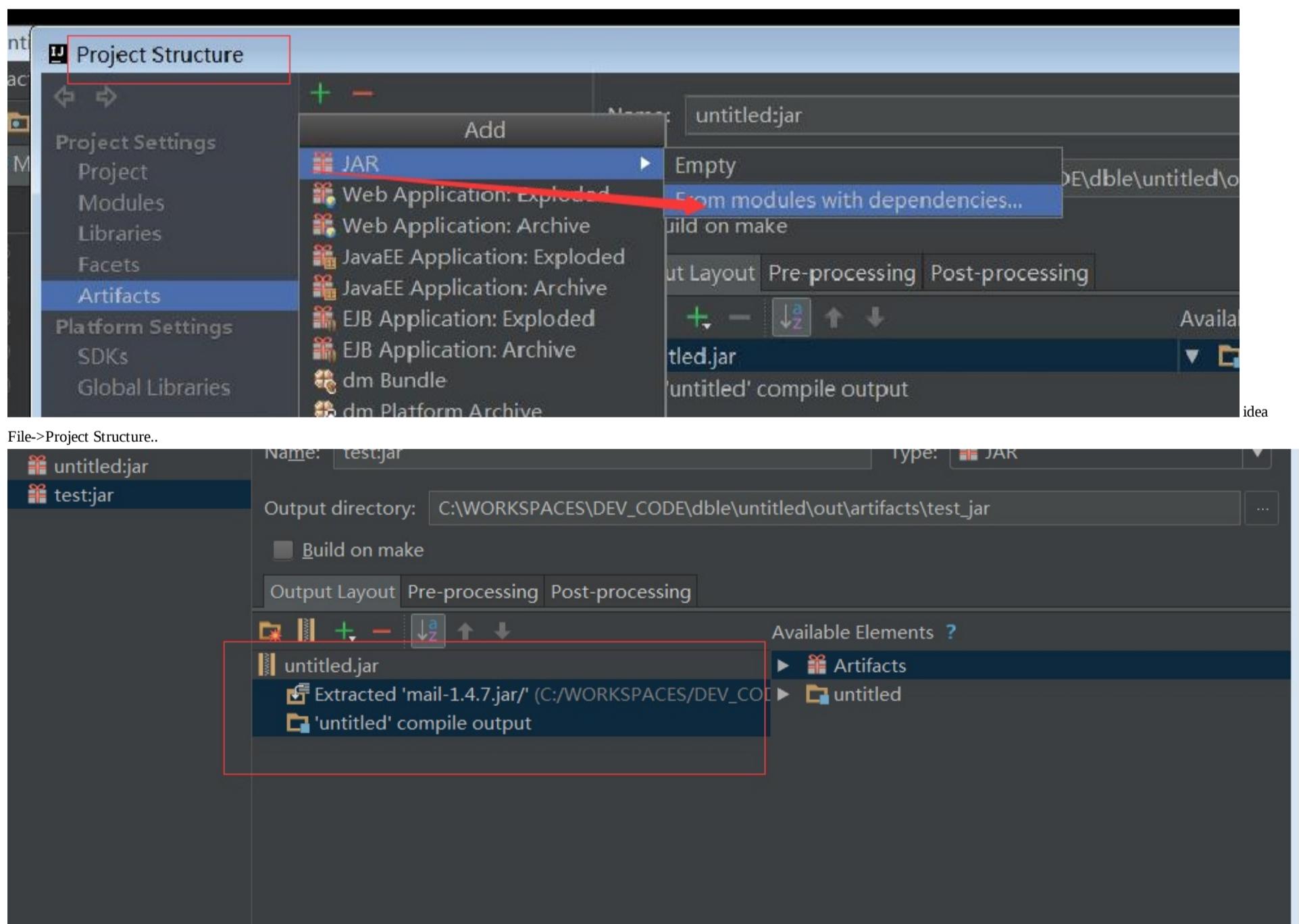
@Override
public void alert(ClusterAlertBean clusterAlertBean) {
    clusterAlertBean.setSourceComponentType(COMPARTMENT_TYPE).
        setSourceComponentId(properties.getProperty(COMPONENT_ID)).
        setServerId(properties.getProperty(SERVER_ID)).
        setTimestampUnix(System.currentTimeMillis()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

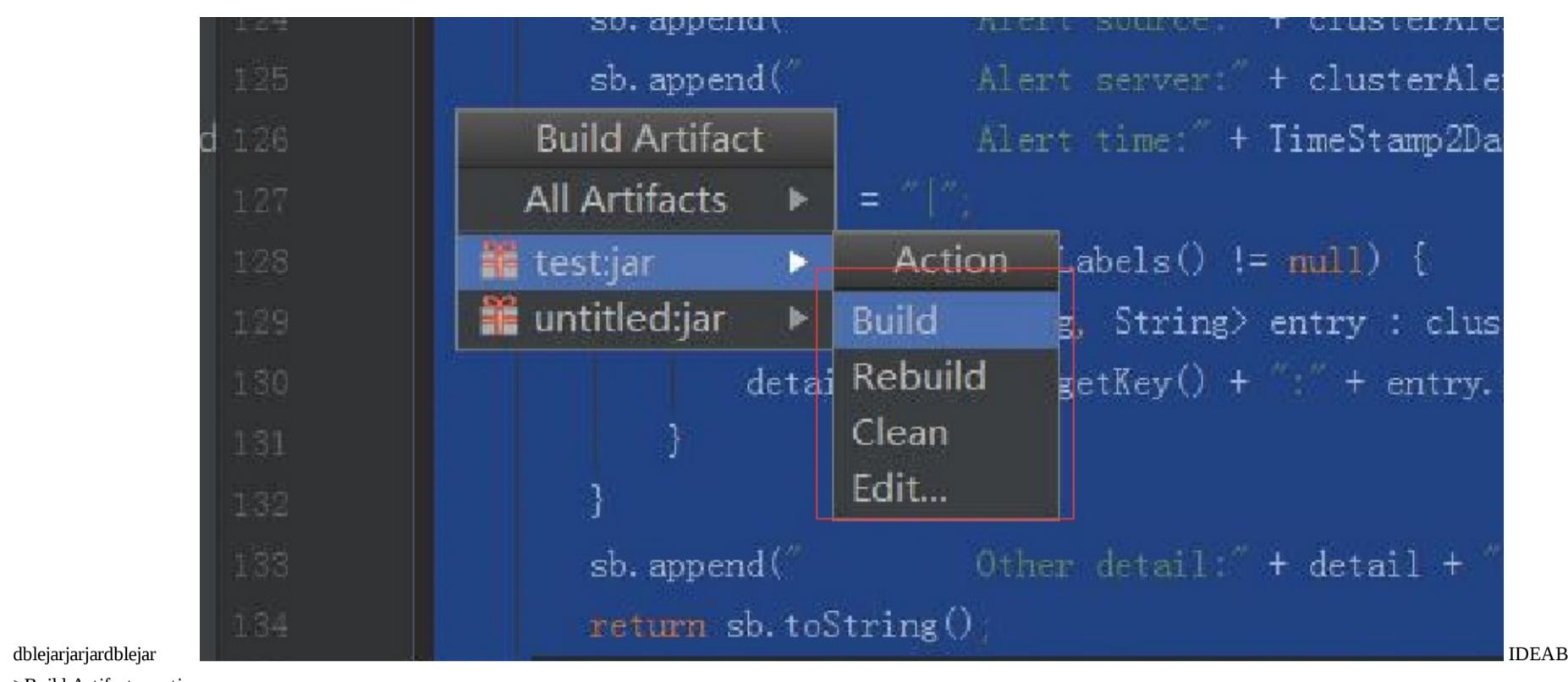
@Override
public boolean alertResolve(ClusterAlertBean clusterAlertBean) {
    clusterAlertBean.setSourceComponentType(COMPARTMENT_TYPE).
        setSourceComponentId(properties.getProperty(COMPONENT_ID)).
        setServerId(properties.getProperty(SERVER_ID)).
        setTimestampUnix(System.currentTimeMillis() * 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





IDEABuild-

>Build Artifacts..outjar

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
component_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_SHARDINGS |              | / |
| DBLE_TABLE_NOT_CONSISTENT_IN_MEMORY    | dble         | / |
| DBLE_GLOBAL_TABLE_COLUMN_LOST          |              | / |
| 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 | / |

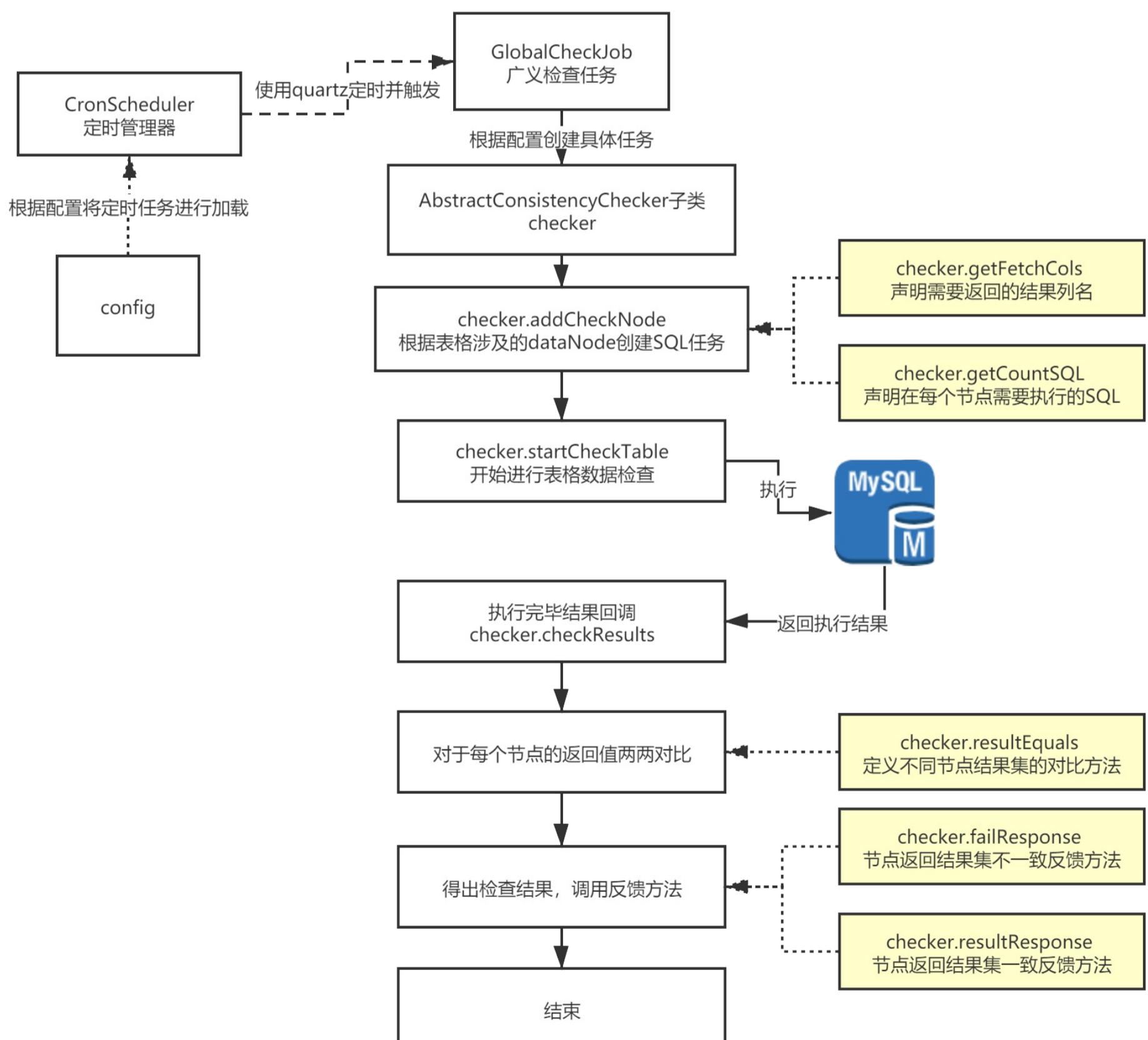


- 
- 
- getCountSQL
- getFetchCols
- resultEquals
- failResponse
- resultResponse
- 
- 

dbletable\_atable\_a

•

dbletable\_a  
dbletable\_a



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

**1.SQL String getCountSQL(String dbName, String tableName)**

SQL  
SQLMySQLDatabase  
SQL

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

**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)**

result result1, 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"));
```

```
 }
}
```

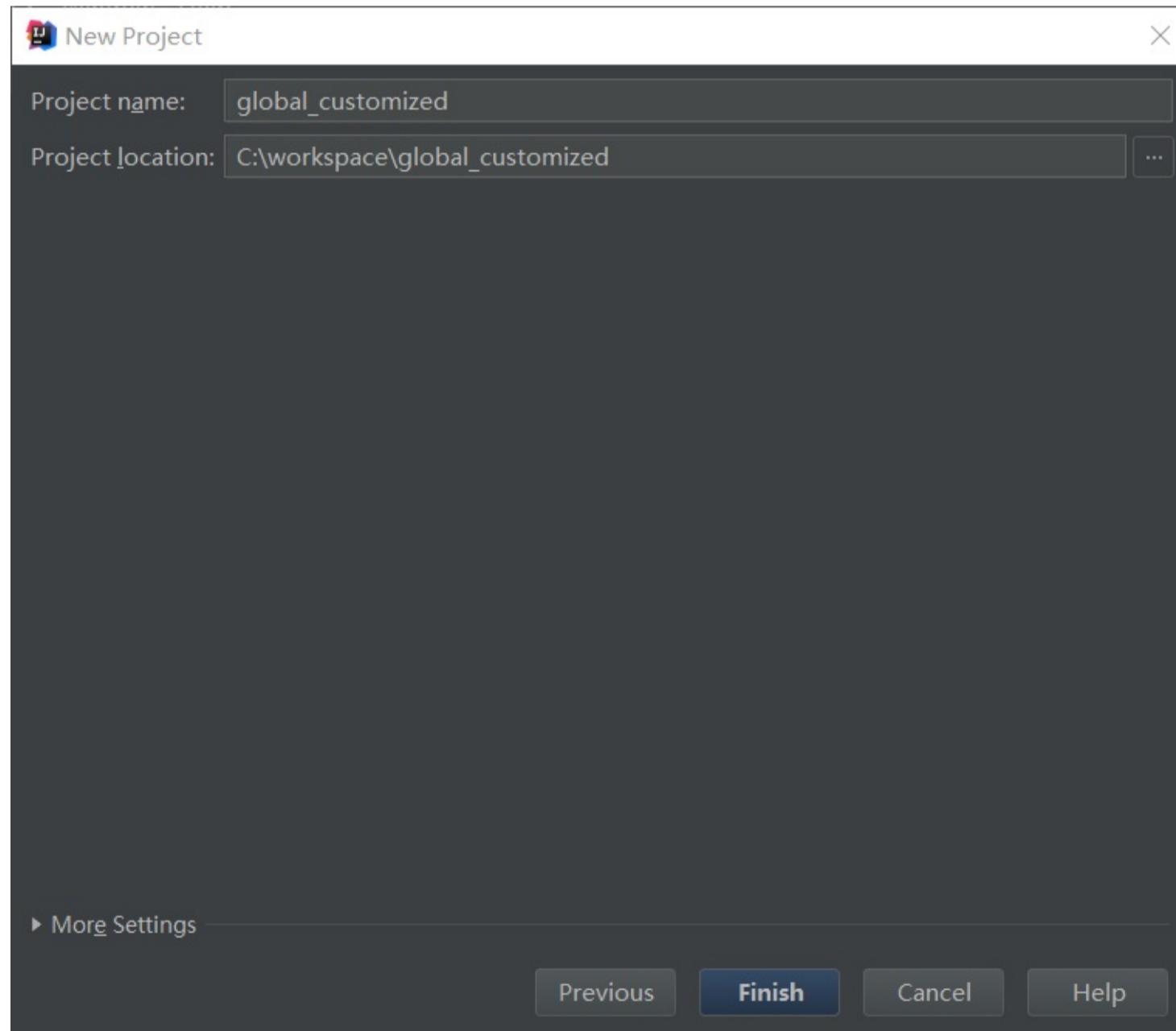
##### 5. void resultResponse(errorList)

```
//
0
```

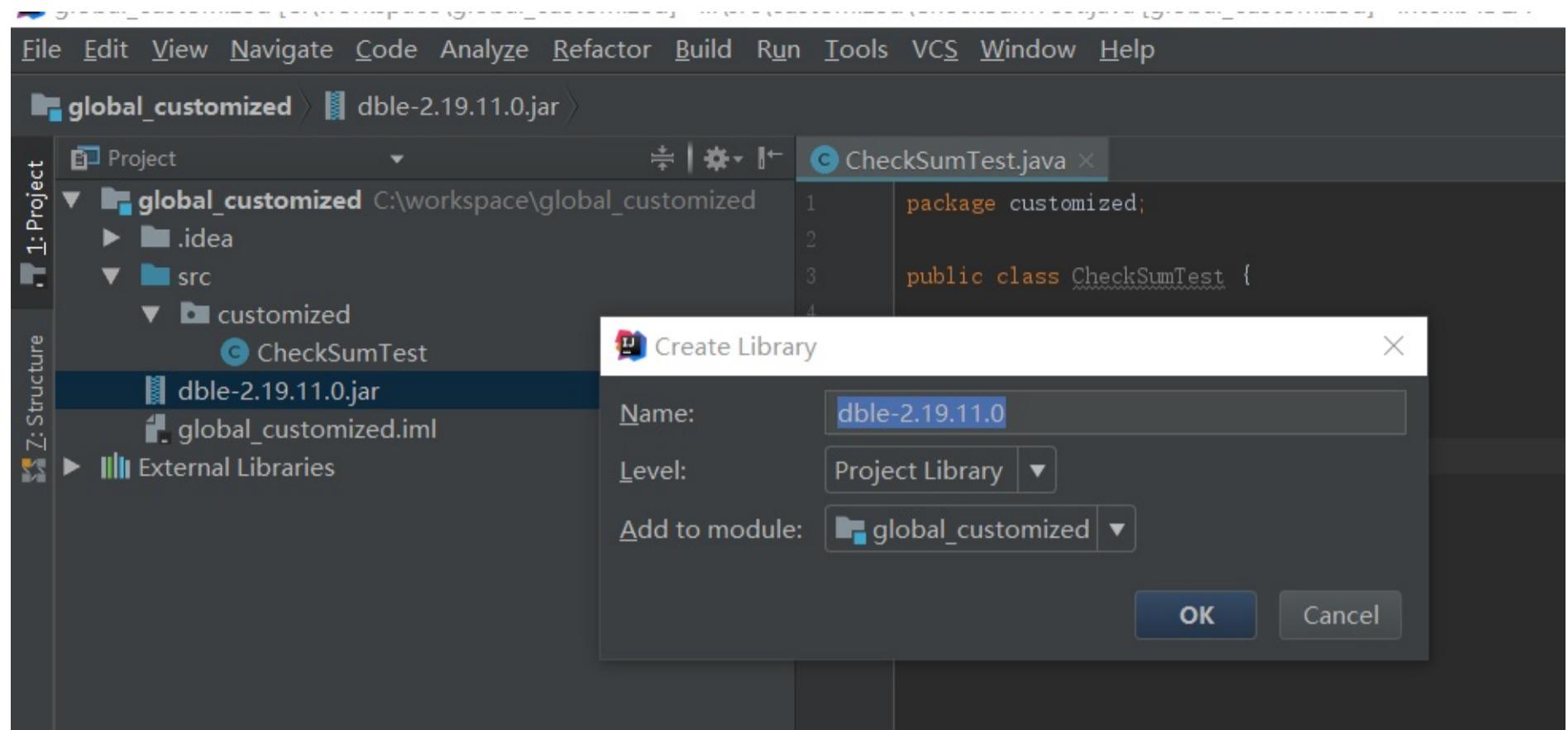
```
public void resultResponse(List<SQLQueryResult<List<Map<String, String>>> elist) {
 //SQLlistSQL
 //SQLSQL
 //
 String tableId = schema + "." + tableName;

 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



35

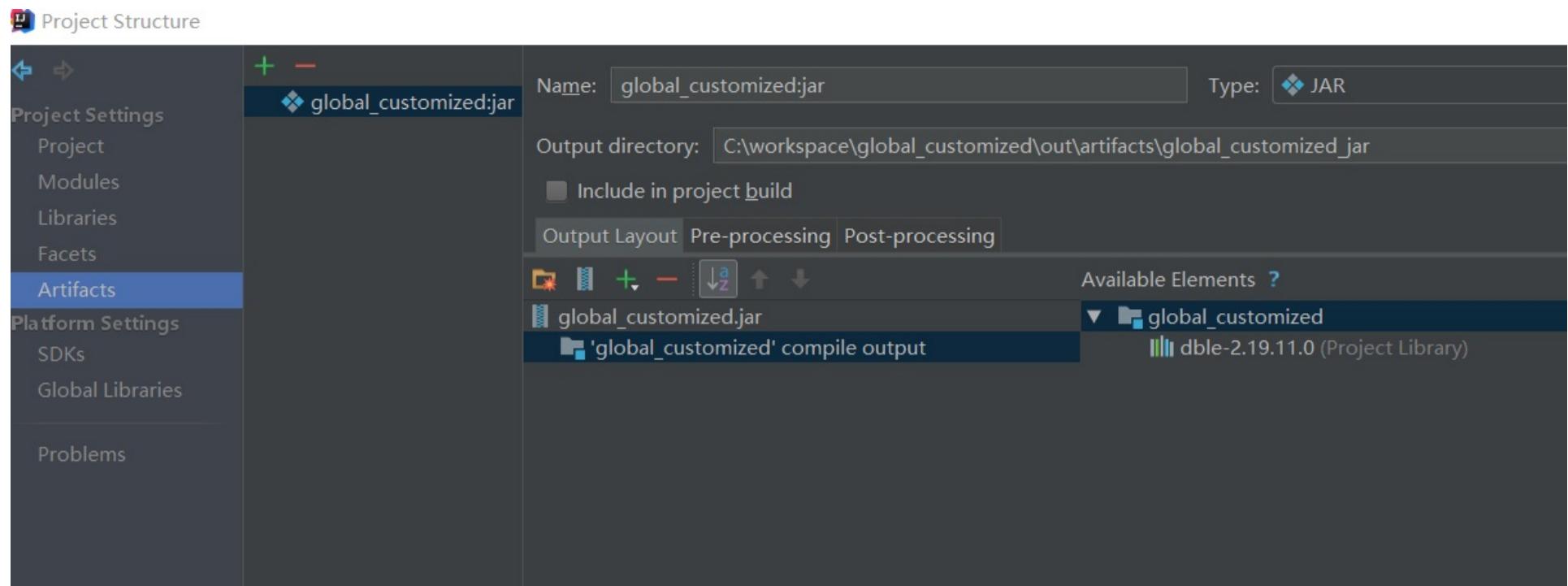
**按照自身的需要实现这几个方法**

```

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<I>
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

```

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"/>
```

jardblejaralgorithmlibdblejavajarjardble  
**jardblereload**

## 1.13 Schema

### 1.13.1

3000+poocschemaschema

### 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 )()
- **Views**: schemaDbleView
- **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\_node dble\_sharding\_table id FC's schema(FC'id did Dble reload id)

```
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](#)
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  - [2.11.1](#)
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  - [2.11.4](#)
  - [2.11.5 heartbeat](#)
  - [2.11.6](#)
- [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

## 2.0 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

- 

### 2.0.1.6 dble\_db\_group

- dble\_db\_group

- db\_group

- 

name	true	
heartbeat_stmt		sql
heartbeat_timeout		0
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		
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		sharding_node
function		
sql_max_limit		

- 

### 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		mysqid
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
-

<code>id</code>	<code>true</code>	<code>tableCschemaMySqltableMschemaMySqltableFc</code>
<code>name</code>		
<code>schema</code>		<code>schema</code>
<code>max_limit</code>		
<code>type</code>		<code>global/single/sharding/child/no sharding</code>

- `name``schema`
- 

#### 2.0.1.13.1 `dble_global_table`

- `dble_global_table`
- 
- 

<code>id</code>	<code>true</code>	<code>dble_tableid</code>
<code>check</code>		
<code>checkClass</code>		<code>class</code>
<code>cron</code>		

- 

#### 2.0.1.13.2 `dble_sharding_table`

- `dble_sharding_table`
- 
- 

<code>id</code>	<code>true</code>	<code>dble_tableid</code>
<code>increment_column</code>		
<code>sharding_column</code>		
<code>sql_required_sharding</code>		<code>sqlRequiredSharding</code>
<code>algorithm_name</code>		

- 

#### 2.0.1.13.3 `dble_child_table`

- `dble_child_table`
- 
- 

<code>id</code>	<code>true</code>	<code>dble_tableid</code>
<code>parent_id</code>		<code>id</code>
<code>increment_column</code>		
<code>join_column</code>		
<code>paren_column</code>		

- 

#### 2.0.1.13.4 `dble_table_sharding_node`

- `dble_table_sharding_node`
- `sharding_node`
- 

<code>id</code>	<code>true</code>	<code>dble_tableid</code>
<code>sharding_node</code>	<code>true</code>	
<code>order</code>		<code>sharding_node(0)</code>

- 

#### 2.0.1.14 `dble_algorithm`

- dble\_algorithm

- 

- 

name	true	
key	true	
value		
is_file		map filetruefilefalsecontentmap file1024

### 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_entry_id
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

- usernameconn\_attr\_keyconn\_attr\_value
- 

#### 2.0.1.15.3 dble\_entry\_table\_privilege

- dble\_entry\_table\_privilege
- privilege
- 

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

- 

#### 2.0.1.16 dble\_blacklist

- dble\_blacklist
- 
- 

name	true	
property_key	true	key
property_value		value
user_configured		

- 

#### 2.0.1.17 processlist

- processlist
- (NULL)
- 

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

- (show @@processlist)

#### 2.0.1.18 dble\_thread\_usage

- dble\_thread\_usage
- 
- 

thread_name	true	
last_quarter_min		15s

last_minute		1min
last_five_minute		5min

- (show @@thread\_used;)

### 2.0.1.19 dble\_reload\_status

- dble\_reload\_status
- reload
- 

index	true	reload[ RL ]
cluster		dble
reload_type		reload reload_matadata/reload_all/manager_insert/manager_update/manager_delete
reload_status		reloadnot_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 | 15293 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 15293 | 2021-07-09 11:18:10.525 |
| 3 | test | 127.0.0.1 | 10.186.63.7 | 24801 | dn2 | instanceM2 | 1 | 3 | 13819 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | sql_select_time | last_update_time |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 3 | test | testdb.tb_jump_hash | 0 | 0 | 0 | 290440 | 2021-07-09 11:18:10.536 | | | | |
| 0 | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | test | null | 0 | 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	ID(IDID)
entry	false	dble_entryid
user	false	
source_host	false	IP
source_port	false	port
rows	false	
examined_rows	false	
start_time	false	
duration	false	

#### **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	ID(ID)
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
- 

dbgroup	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	IPMySQOLID
writing_queue_bytes	false	
reading_queue_bytes	false	null
flow_controlled	false	

- 

## 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\_group dble\_db\_instance db.xml MySQL dble\_db\_group dble\_db\_instance

#### 2.0.2.4.2 dble\_rw\_split\_entry

- idblacklist type

#### 2.0.2.4.3 dble\_thread\_pool

- UPDATE/INSERT/DELETE
- core\_pool\_size

1JDKThreadPoolExecutor core\_pool\_size

2AIONIOFront RW NIOBackend RW NIONIOFront RW NIOBackend RW

3

### 2.0.2.5 TRUNCATE

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 sql\_log

## 2.0.1.27 dble\_config

## db.ledgershardingusersequence

```
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": "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`}}]}}, {"row": 1, "time": "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 }] }, { "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

dble\_configdble

## 2.1

- [2.1.1 select](#)
- [2.1.2 set](#)
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## 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+1024dblemysql max\_allowed\_packet dble  
 2.dble  
 3. show variables like 'max\_allowed\_packet' mysql  
 4.dblemysql

```
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:  
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 | 1 | 0 | 216 | 217 |
| complexQueryWorker | 0 | 0 | 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 | 4 | 1 | 0 | 45 | 46 |
| backendWorker | 12 | 0 | 0 | 1631 | 1631 |
| complexQueryWorker | 8 | 0 | 0 | 98 | 98 |
| writeToBackendWorker | 2 | 0 | 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
```

```
+-----+-----+-----+-----+-----+-----+
| 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: truefalse  
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
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+
| 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 configdb
 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 | 0:0:0:0:0:0:1 | 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;**

50sql(5)

```
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
```

show @@sql true;

### 2.1.3.20 show @@sql.high

**show @@sql.high;**

sql(10245)

```
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
```

show @@sql.high true;

### 2.1.3.21 show @@sql.slow

**show @@sql.slow;**

(100reload)sql(10sqlRecordCount5

```
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
```

show @@sql.slow true;

### 2.1.3.22 show @@sql.resultset

show @@sql.resultset;

(512KmaxResultSet) sql

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

```
ID:
USER:
FREQUENCY:sql
SQL:
RESULTSET_SIZE:
```

### 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 | 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:
W:()
R%:W0100%
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:(:,bug)
R:
W:()
R%:W0100%
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;

xxdbinstance

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 |
+-----+-----+
```

```
| 0:0:0:0:0:0:0:1 | 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_USED:DirectMemory
```

**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;
```

```
10000sql(10,5)
```

```
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
```

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

### 2.1.3.38 show @@sql.condition

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

```
reload @@query_cf table&columnsq.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-writeToBackendWorker | 0% | 0% | 0% |
| 1-backendWorker | 0% | 0% | 0% |
| 1-frontWorker | 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
Sqlddl 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_IDxaaid
XA_STATExa
SHARDING_NODEShashingNode
```

**2.1.3.46 show @@reload\_status**

show @@reload\_status

dbreload

```
+-----+-----+-----+-----+-----+-----+
| 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:reloadnot_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
Table
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,xxxxxxxxx;' autocommit=nautocommit=nsq1
4. sharding)set xa = on/off/1/0'rwspliXA start/end/prepare/commit/rollback XXX'sql
5. rwsplimulti-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_GROUPdbinstanceDB_GROUP
DB_INSTANCEdbinstance
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 |
| associateTablesByEntryByUserTableSize | 1024 |
| frontendByBackendByEntryByUserTableSize | 1024 |
| tableByUserByEntryTableSize | 1024 |
| samplingRate | 0 |
| sqlLogTableSize | 1024 |
| queueMonitor | monitoring |
+-----+-----+
6 rows in set (0.01 sec)
```

:

```
statistic/
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;

0

```
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

## 2.1.6 stop

### 2.1.6.1 stop @@heartbeat

**stop @@heartbeat keys:dbGroup**

keys:dbGroupkeydbGroup      **key:**dbGroup dbGroup\$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.xmlldb.xmlsharding.xml

-s ERROR

-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;**

:

show @@sql;

show @@sql.sum;

show @@sql.slow;

show @@sql.high;

show @@sql.large;

show @@sql.resultset;

OK

### 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
```

### 2.1.9 offline

**offline;**

dble, dblepingselect user

OK

## **2.1.10 online**

### **online**

dbleoffline  
OK

### 2.1.13 dryrun

reloaddryrun

sharding.xml reloaddryrun 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>
```

dry run

```
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,WARNNING

DETAIL :

## 2.1.14 shardingNode

shardingNodedbGroup shardingNodes shardingNode

### 2.1.14.0

```
pausedblequeuewait_limitresume,
pausetimeoutsqldblesql
pausedble server pause shardingNode reloaddbble
reload
```

### 2.1.14.1

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

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_EXISTfalse
```

## check

### 2.1.17.0 check @@metadata

meta

- check @@metadata
  1. reload @@metadata datatime
  2. reload @@config\_alldatatimedatetime
  3. metadatatetime
- check full @@metadata ;:
  - where schema=? and table=?
  - where schema=?
  - where reload\_time='yyyy-MM-dd HH:mm:ss' , where reload\_time>='yyyy-MM-dd HH:mm:ss' , where reload\_time<='yyyy-MM-dd HH:mm:ss'
  - where reload\_time is null
  - where consistent\_in\_sharding\_nodes=0
  - where consistent\_in\_sharding\_nodes = 1
  - where consistent\_in\_memory=0
  - where consistent\_in\_memory = 1
  - If no where, retrun all results.
- check full @@metadata :

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

column table\_structure show create table

column consistent\_in\_sharding\_nodes 01

column consistent\_in\_memory meta01

table\_structure null consistent\_in\_sharding\_nodes consistent\_in\_memory  
consistent\_in\_sharding\_nodes 0 consistent\_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  
hangreload metadataable OK ERROR

- configtable metareload @@metadatameta
- reloadreload5999SQLCODE“meta”
- dblereload [show @@reload\\_status](#)

## 2.1.19 split

POCdblesqldble 2.19.09.0mysqldump

### dump

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

```
mysql > split src dest [-sschema] [-r500] [-w512] [-l10000] [--ignore] [-t2]
- srccdump
- destdump
- -sdumpschemaschemadumpschemaschemadump
- -r500
- -w512
- -lsplitinsertvalues,4000
- --ignoreinsert
- -tinsert
 -sschema -sschema -sschema
```

-shardingNode-.dump

dump /tmp/mysql\_dump.sql /tmp/dump/

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

splitdblesqldble.logsplitlog4j.xml

```
<Configuration status="WARN">
 <Appenders>
 <!-- dbelog4j.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>
 <!-- dbelog4j.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

/

&lt;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 A A reload reload B

### 2.1.22.5

[https://actiontech.github.io/dble-docs-cn/2.Function/2.08\\_cluster.html](https://actiontech.github.io/dble-docs-cn/2.Function/2.08_cluster.html)

- 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 rwSplitUserdbGroup dbGroup db.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. dbledbGroup dbGrouprwSplitUserdbGroup db.xmlshardingUserdbGroupschemassharding.xmlshardingNode
3. rwSplitUserdbGroup
4. dbGroup instancedbGroup instance

#### 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

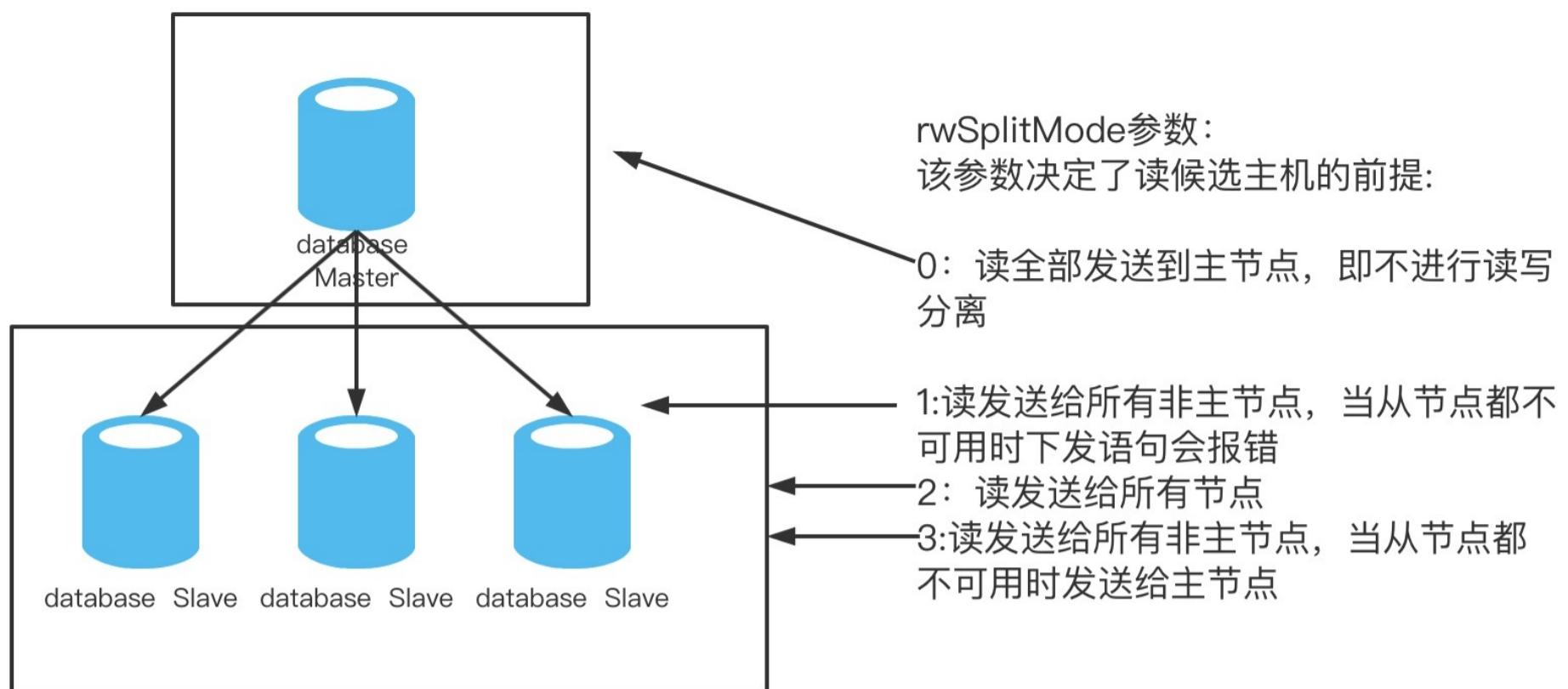
- (primary="true")
  - rwSplitMod2dbInstances
  - (primary primary="false")
    - dbInstances
    - dbInstances
- -

#### 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	$\text{rwStickyTime} > 0 \text{ (500ms-timeA)} \\ \leq \text{rwStickyTimeSQL}$
3	600ms	Hint_SQL_2(*slave*/ sql)	slave	
4	900ms	SQL_3	master	$\text{rwStickyTime} > 0 \text{ (900ms-timeA)} \\ \leq \text{rwStickyTimeSQL}$
5	2000ms	SQL_4	slave	$(\text{rwStickyTime} > 0 \&\& (2000ms-timeA) \leq \text{rwStickyTime})$

SQSLSQL select... show ... SQSLSQL.

## 2.4 /Hint

Hint, :SQLSQL“”

- 
- dbleinsert...select...

SQLSQLSQLSQLSQLSQLSQLSQL

### 2.4.1 Hint

Hint

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

“/\*#dble: \*/” for mybatis and “/\*!dble: \*/” 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)up roxy slavedblemaster

## 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 5.7dbeXA

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

SQL dble SQL 100

JDBCXAdemo

0

```

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";

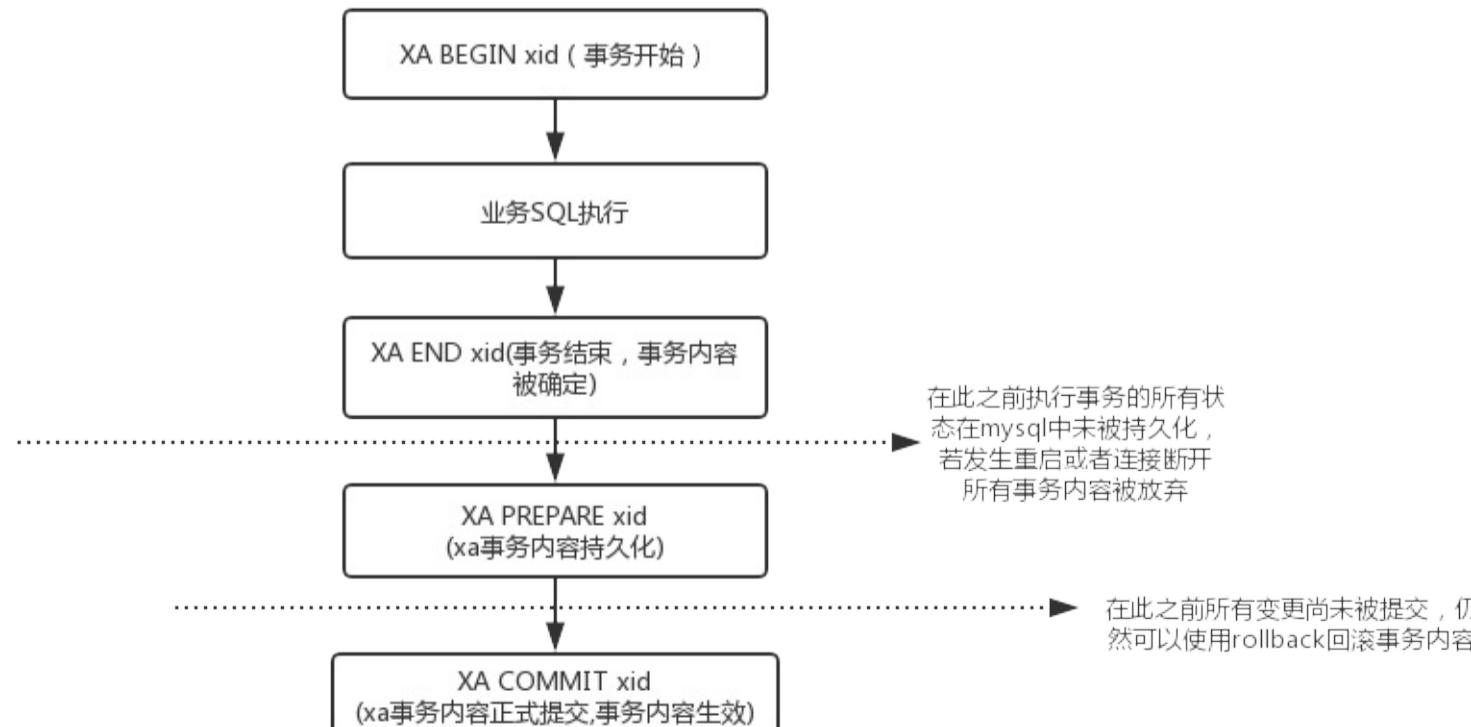
 public static void main(String[] args){
 try {
 //1.
 Class.forName("com.mysql.jdbc.Driver");
 //2.
 Connection conn = DriverManager.getConnection(URL, USER, PASSWORD);
 //3.
 Statement stmt = conn.createStatement();
 stmt.execute("set xa = 1");
 //xa
 stmt.execute("begin");
 try {
 //catch
 //rollback
 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

xamysq|5.7xa

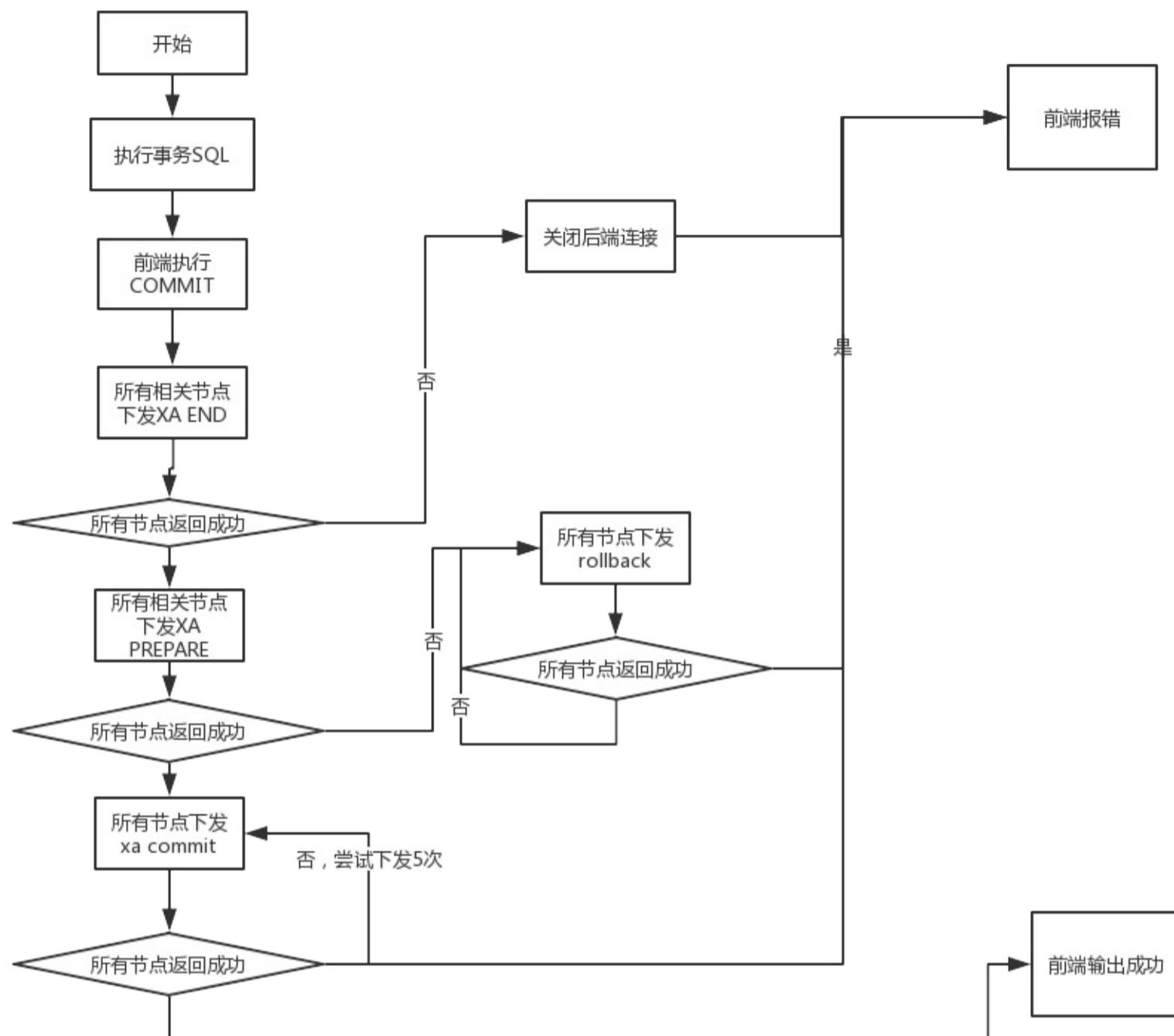




## 2.5.2 XA

### 2.5.2.1 XA

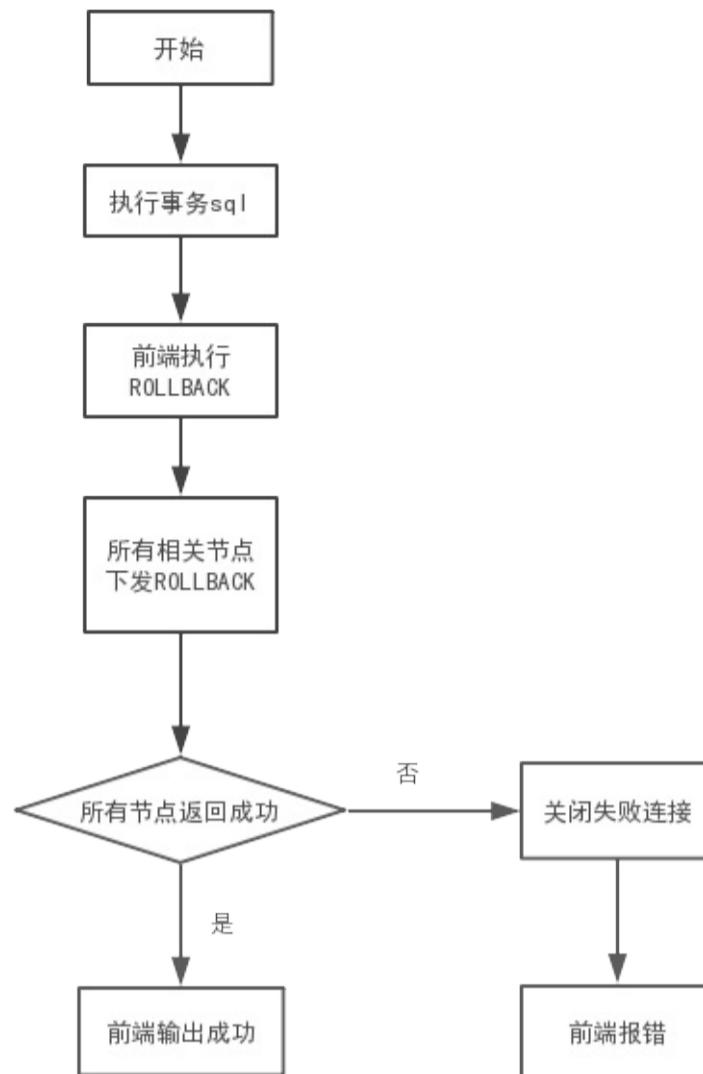
DbleXA



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.cnfxaRetryCountxa

1. xaRetryCount 0
2. xaRetryCount 0xaRetryCount

#### 2.5.2.3.2

2.19.03.0

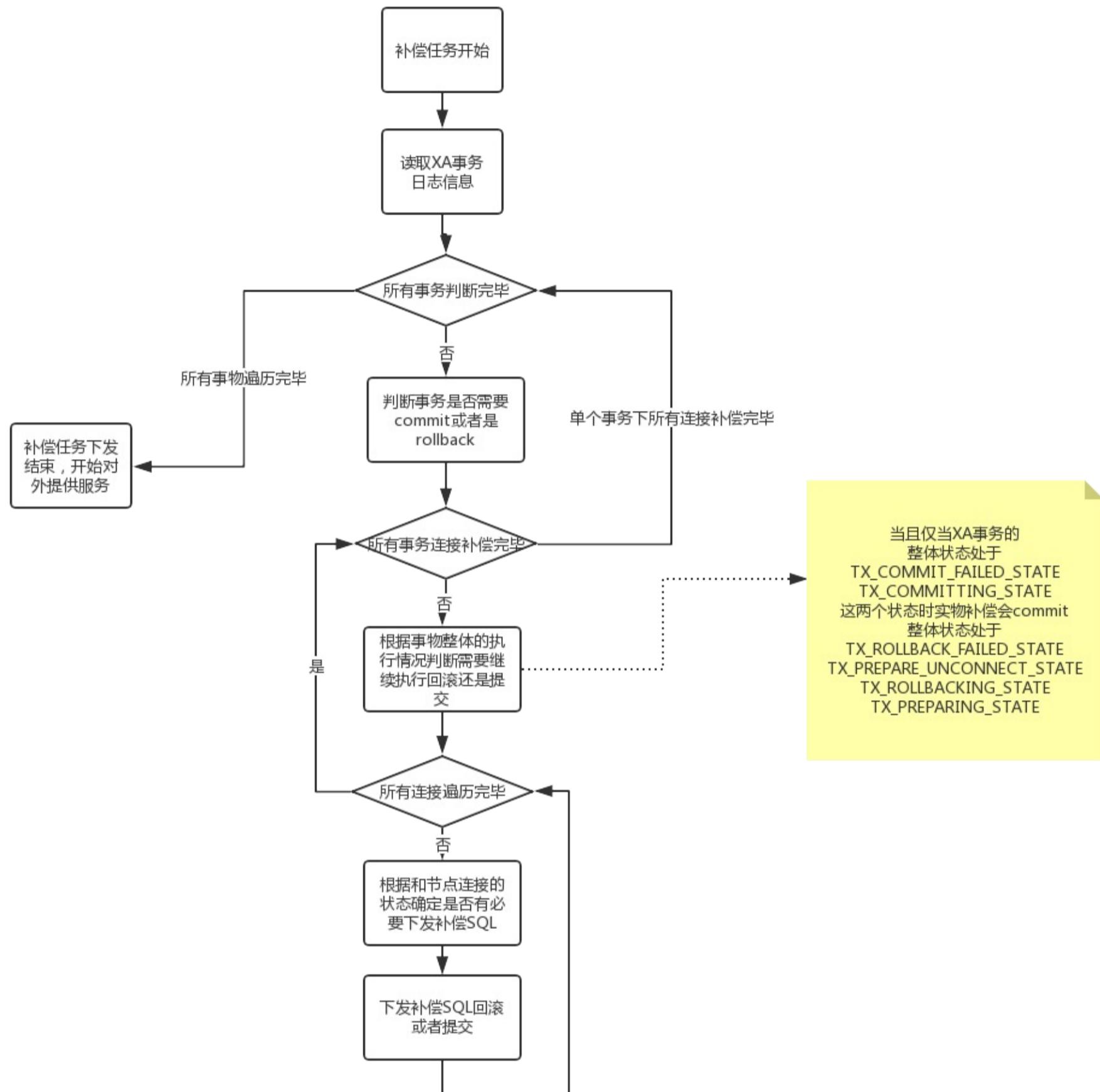
1. show @@session.xa xa
2. kill @@xa\_session id1,id2... sessionxa

#### 2.5.2.3.3

### 2.5.3 XA

#### 2.5.3.1 XA

XA dbleXA dbleXA XA



XASQLdbe

#### 2.5.3.2 XAxaLogClean

xa.bootstrap.cnf xaLogCleanPeriod

#### 2.5.3.3 XAxaSessionCheck

dblecommit(commit,XApreparecommit) rollback xaprepare

## 2.5.4 XA

### 2.5.4.1 XA

DbleXADBLEXA

```

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

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

```

### 2.5.4.2 XAstatus

status		
0	TX_INITIALIZE_STATE	XA
1	TX_STARTED_STATE	XA XA
2	TX_ENDED_STATE	XA END
3	TX_PREPARED_STATE	XA PREPARED
4	TX_PREPARE_UNCONNECT_STATE	XA PREPARED
5	TX_COMMIT_FAILED_STATE	XA COMMIT
6	TX_ROLLBACK_FAILED_STATE	XA ROLLBACK
7	TX_CONN_QUIT	mysql

8	TX_COMMITED_STATE	XA
9	TX_ROLLBACKED_STATE	XA
10	TX_COMMITTING_STATE	XA
11	TX_ROLLBACKING_STATE	XA
12	TX_PREPARING_STATE	XA prepare

### 2.5.4.3 XA

xa

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

Dble

ZK

ZKDbleZKXAZK

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

### 2.5.4.4

1ShardingRwSplit

2()begin

3Modifysql

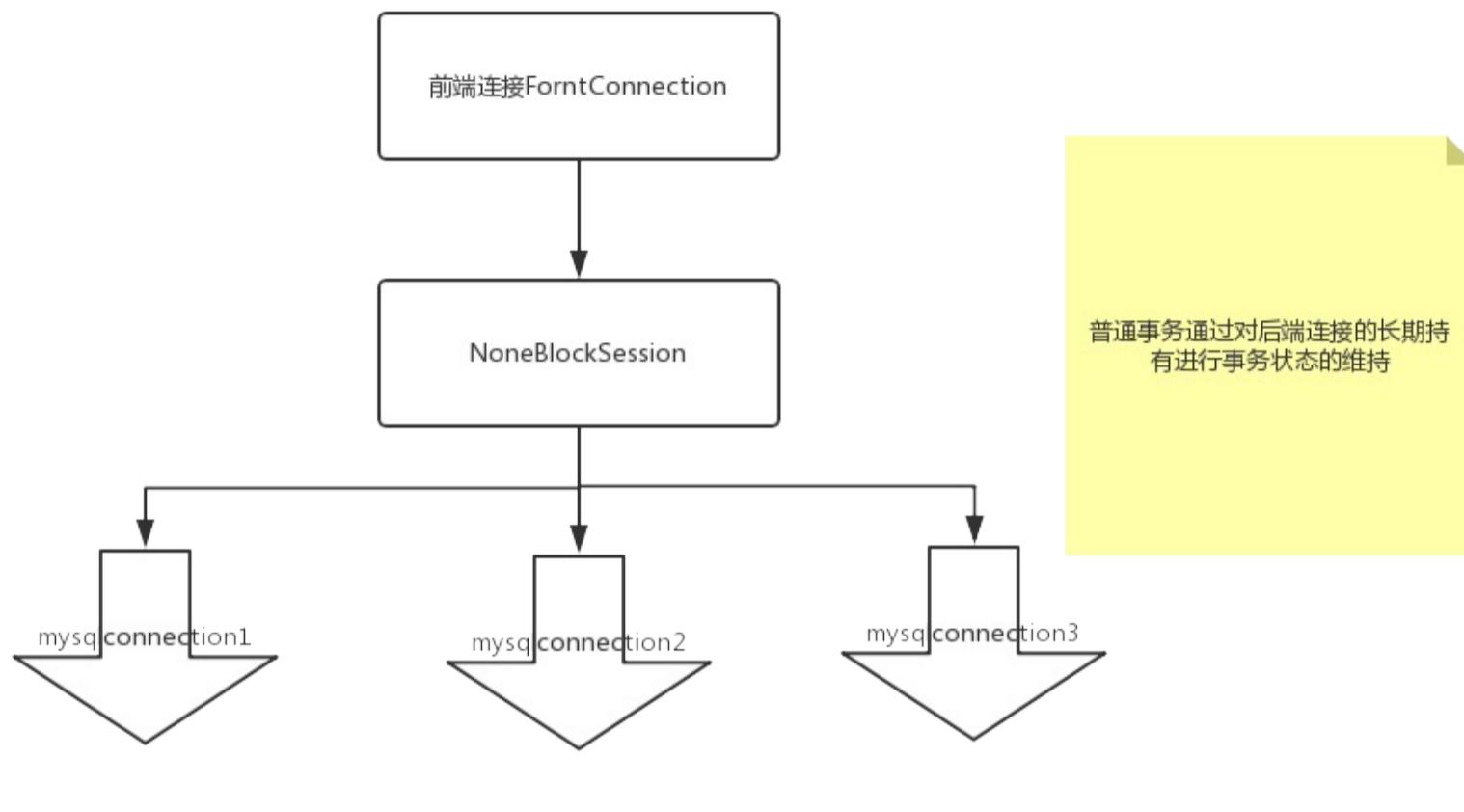
4Modifysql

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 : dblexaIDInc1(); xaRecovery Xid, xaIDIncXidxaIDInc+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, ;

**(5min)**

XidxaIDIncdble(xaIDInc, Xid,

### 2.5.6.3

#### xa

, dble\_xa\_recoverXA.

#### dbleXid

, session\_connections(show @@connection)xa\_id, xa\_idXid\_SessionXA.

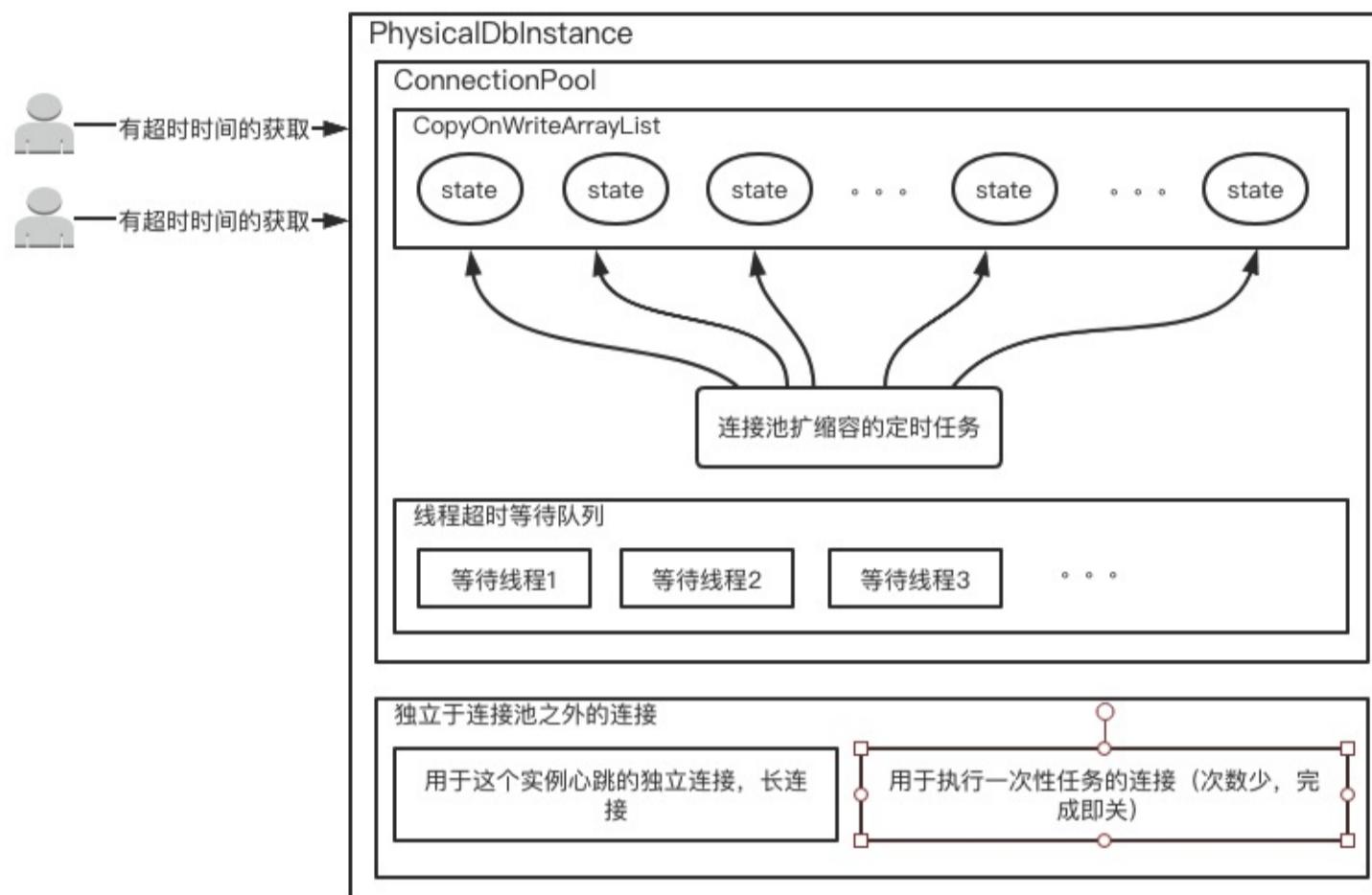
## 2.6

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

minConminConmin( - - ) - 0

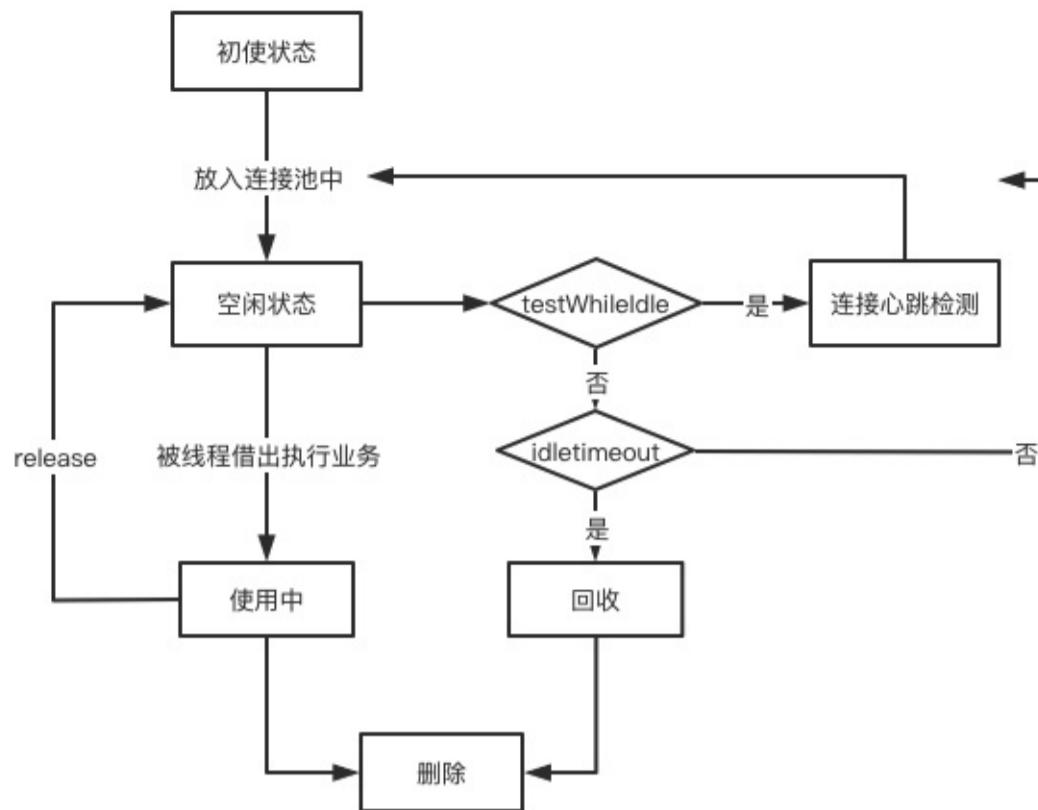
minConminCon - > 0 && idleTimeout

#### 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:db="http://dble.cloud/">

<dbGroup name="dbGroup1" rwSplitMode="1" delayThreshold="100">
 <heartbeat errorRetryCount="1" timeout="10">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>
</db:db>

```

### 2.6.5 dble

dbleMySQLheartbeatPeriodMillis dbleMySQLevictor

#### 2.6.5.1

- 
- 

### 2.6.5.2

dble

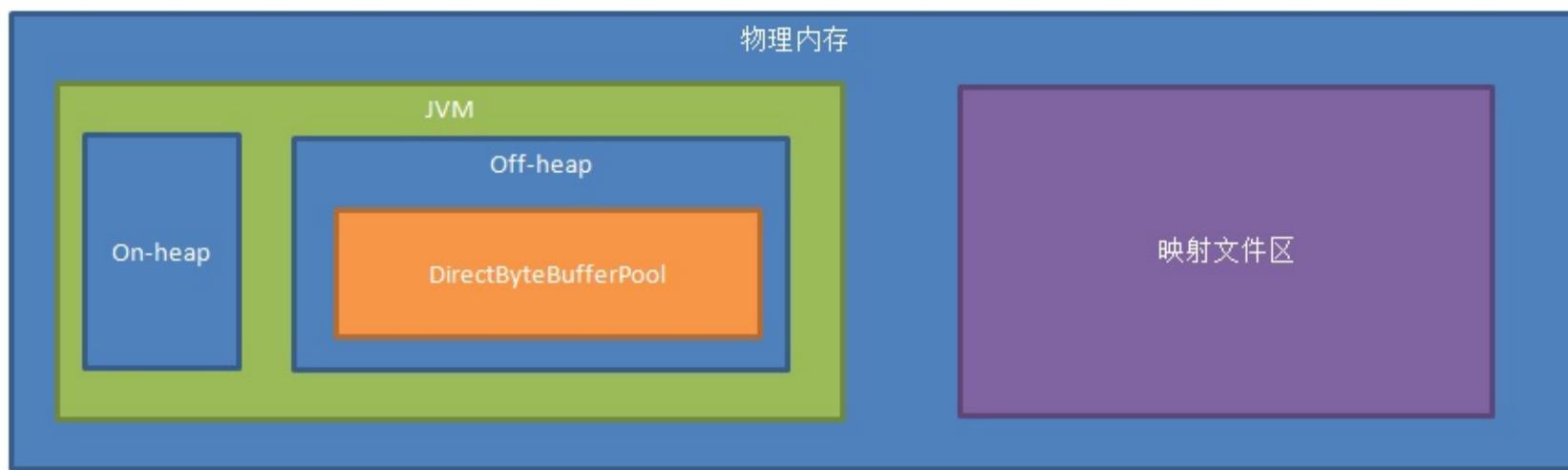
- init
- ok
- timeoutHeartbeatTimeout
- errordble

### 2.6.5.3

- dblerrorerrorRetryCountok
- dblerrorRetryCounterror
- timeoutOK, init

## 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
- ```

tmpMin= Min( free)
=((tmpMin/mappedFileSize))
= *mappedFileSize (mappedFileSize64M)
mappedFileSizebootstrap.cnf

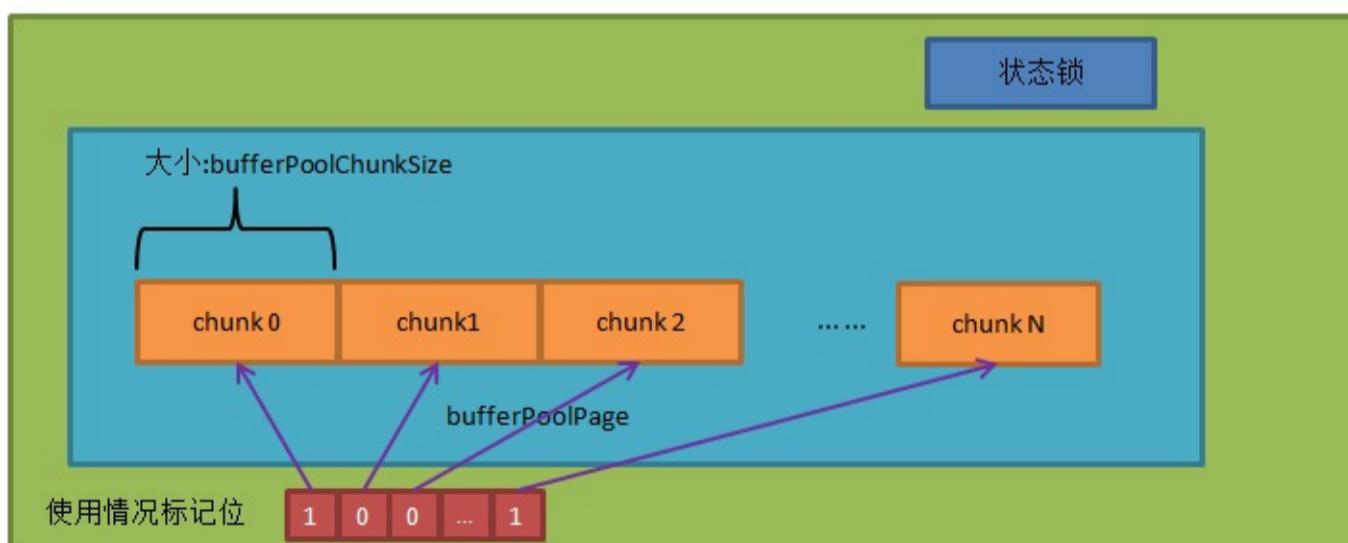
```

2.7.2 DirectByteBufferPool

BufferPool



bufferPoolPage:



1.:

1.1

1.2 buffer

2.

bufferPoolPageNumberbufferPoolPageSize

3.

3.1

(bufferPoolChunkSize 4k,bufferPoolPageSize)

0

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

- Join4Mjoin
- Order4M
- Other4Mdistinct group nestloop

,Heap 4M

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

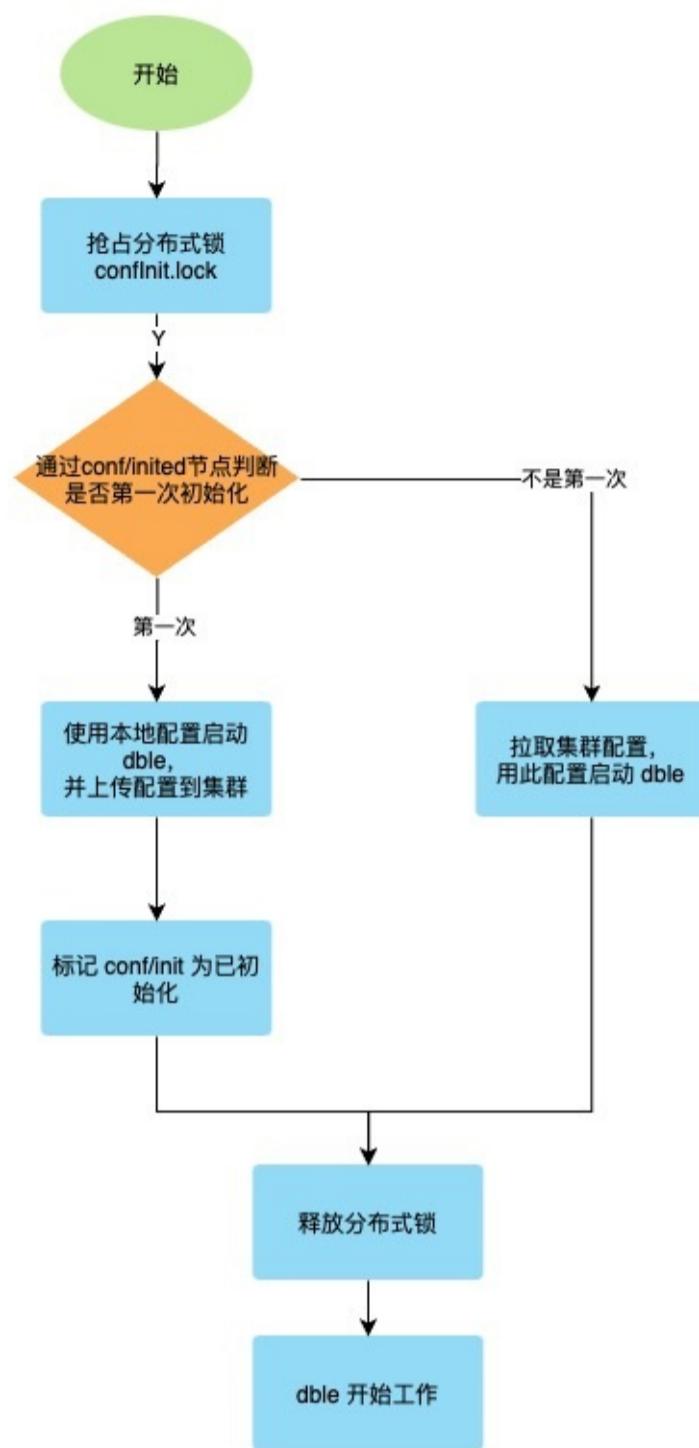
2.8.3

1.

init_zk_data.shZK,ZK

2.

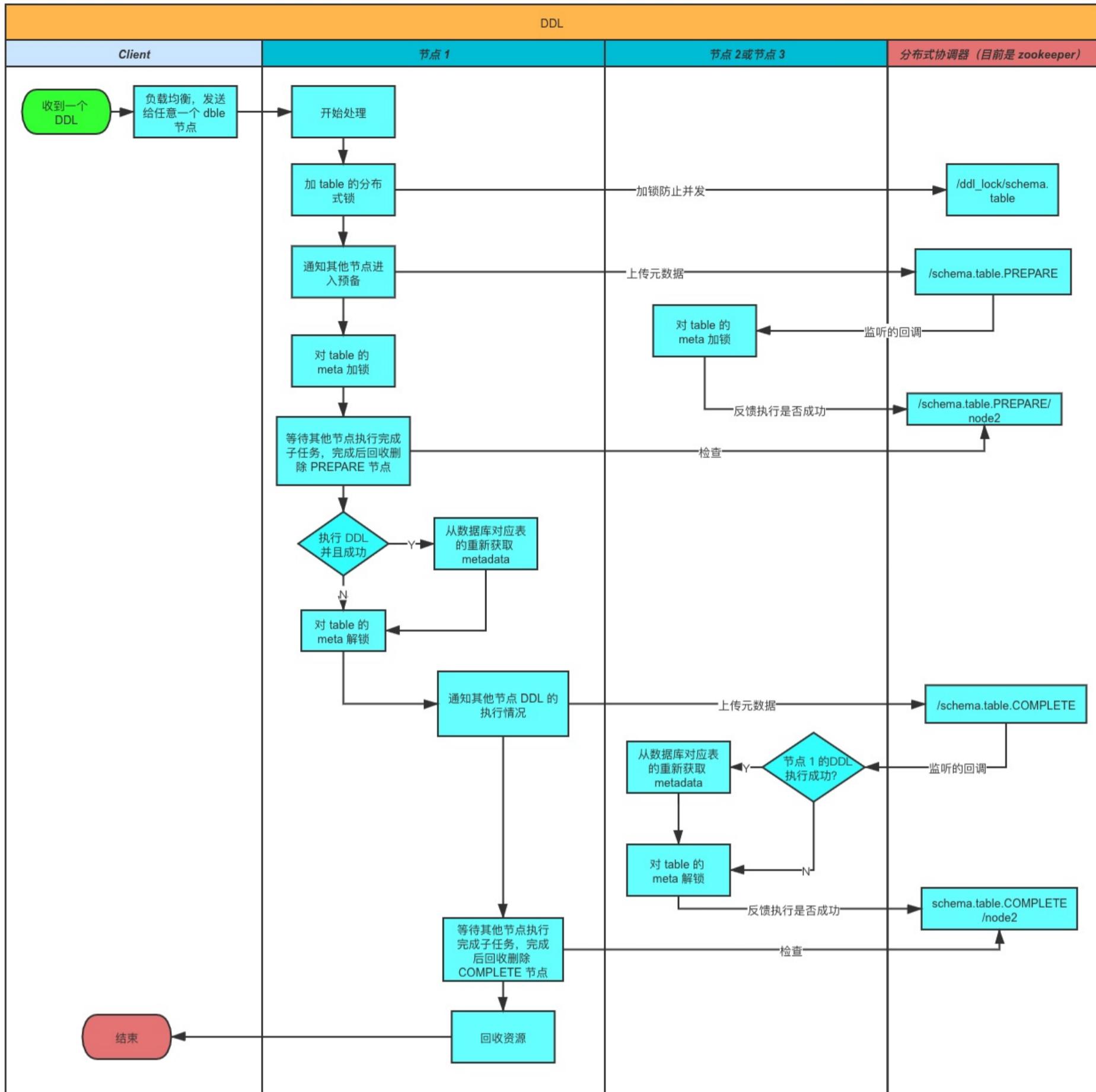
ZK,ZK
ZK



2.8.4

A.DDL

DDLZKZK



1. DDL
DDL,

1. ""

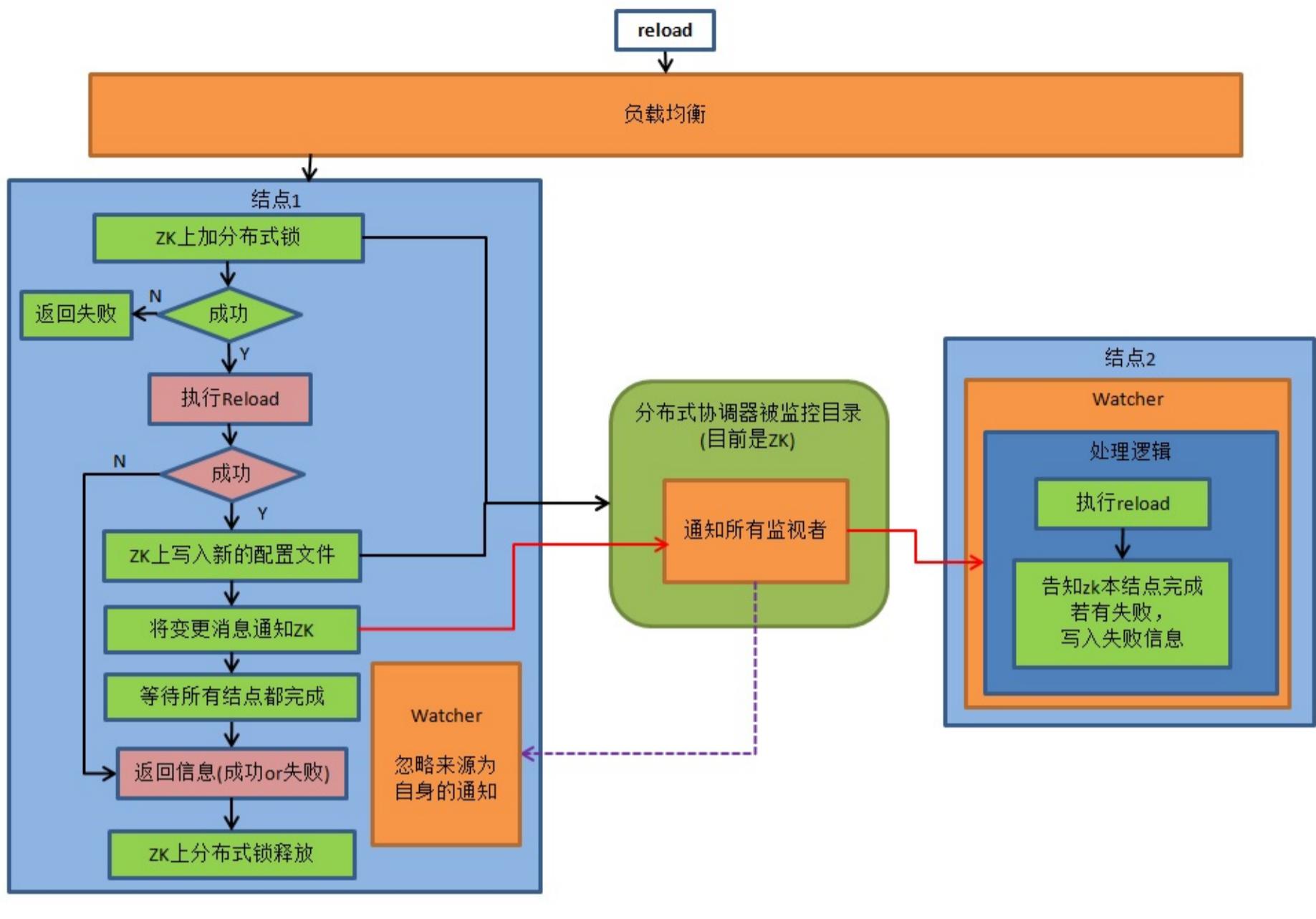
1. DDLtablemetaZKddlmetareload metadata

1. meta

(meta,reload meta)

1. :view,viewview

B.reload @@config/ reload @@config_all



db.xmlsharding.xml, userxml, sequence_conf.properties

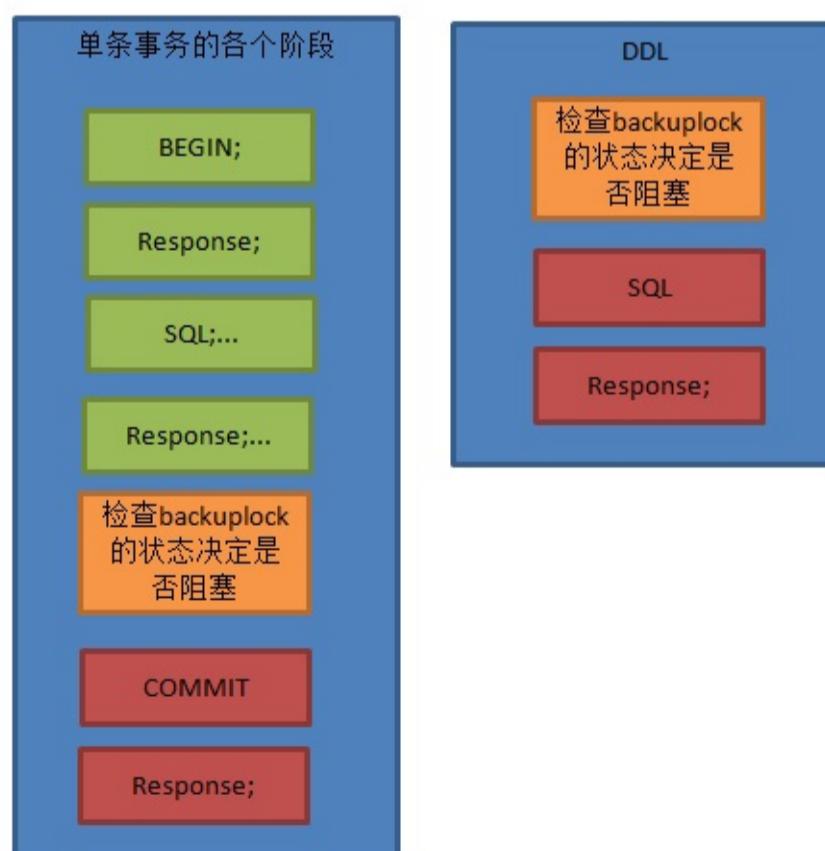
sequence_db_conf.properties

C.binlog

:

binlogshow master status binlog

```
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)
```

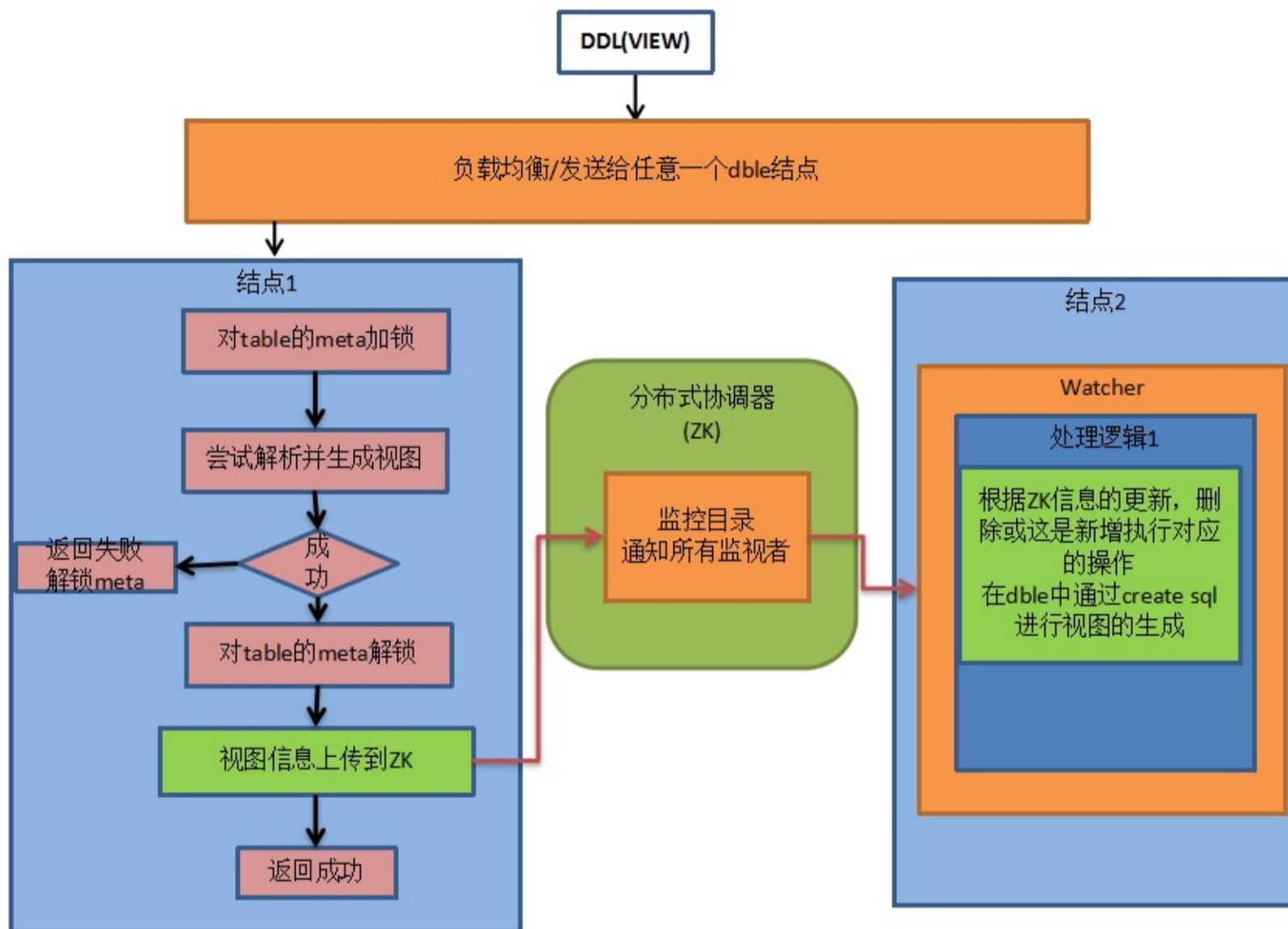
1.ZKzk
2.session
3./ZK
4.show @@binlog.status
5.ZK

ZK

ZK/zk

D.View

zkviewdble



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

E.online

dbleonlineDDL

1.dble 2.dbleDDLBinlog

F.

needSyncHa

F.1 disable

- 1.
- 2.disable
- 3.
- 4.disable
- 5.
- 6.

F.2 enable

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

F.3 switch

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

G.**G.1 pause**

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

G.2 resume

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

2.8.5 XA

XAzookeeper

2.8.6 ZK

```

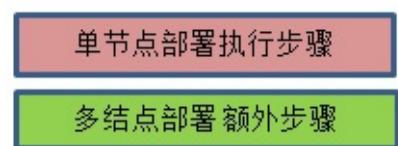
rootPath(cluster.cnf)
clusterId(cluster.cnf)
conf
  init
  status
  operator
    instanceName(keybootstrap.cnf:reloadid)
sharding(sharding.xmljson)
db(db.xmljson)
user(user.xmljson)
migration()
  pause
    instanceName(keybootstrap.cnf:)
  resume
    instanceName(keybootstrap.cnf:)
sequences
  instanceid //zk
  incr_sequence/
  table_name
  common(sequence_conf.properties sequence_db_conf.properties)
binlog_pause
  status ()
  instanceName(keybootstrap.cnf:)
lock
  syncMeta.lock(,)
  confInit.lock
  confChange.lock
  binlogStatus.lock
  ddl_lock/schema.table
  view_lock/`schema`.`table`
  dbGroup_locks/groupName
  pause_node.lock
online
  instanceName(keybootstrap.cnf)
  dd1
    schema.table.PREPAREdd1
    instanceName(keybootstrap.cnf:)
    schema.table2.COMPLETEd1 dd1
    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

2.8.8



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

dbleddlll

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

zookeeper(1.1 cluster.cnf)Meta:

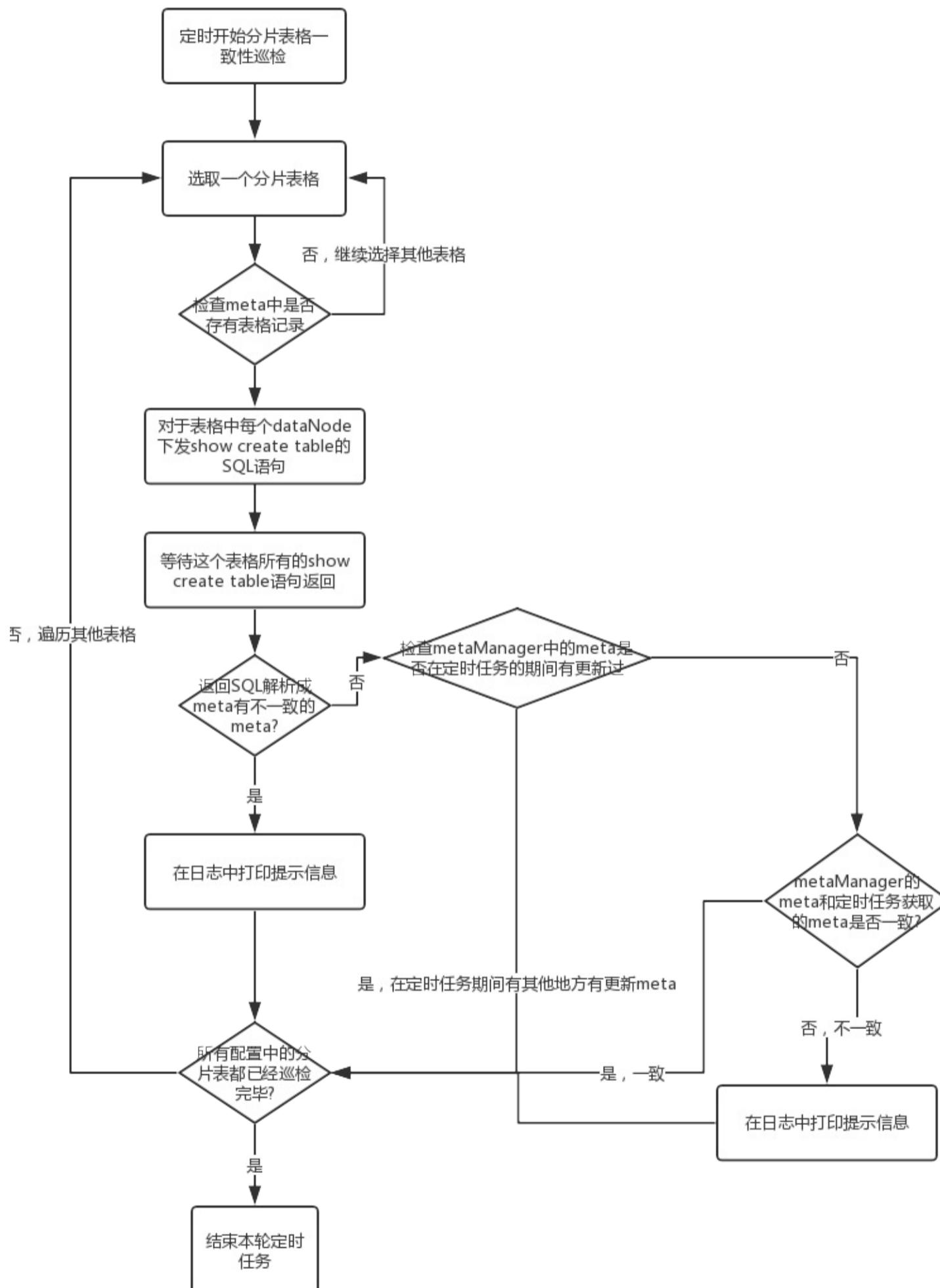
1. zookeeper
dble
2. zookeeper
:
a. dblezookeeper
b. dblezookeepr
c. dble

2.10.3

DbleDbleDble

tableStructureCheckTaskcheckTableConsistencyPeriod30×60×100030checkTableConsistency0bootstrap.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 dblereoloaddble

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

Dbleviewkey ZK 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](#)

2.11.1

```
dble  
useSqlStat
```

2.11.1.1

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

```
table column
```

```
reload @@query_cf;
```

2.11.1.2

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

2.11.2

useSqlStat

2.11.2.1

-
-
-
-

2.11.2.2

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

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

2.11.3

useSqlStat

2.11.3.1

- 1.
2. NSQLsqlNsqliRecordCount10SQLTsql
:
3. **reload @@sqlslow=t;**
t
4. 50
5. 1000010select
6. 1024sql
7. MsqlM maxResultSet

2.11.3.2

- show @@sql;
- show @@sql.high;
- show @@sql.large;
- show @@sql.resultset;
- show @@sql.slow;
- show @@sql.sum.user;

2.1

2.11.3.3

:
reload @@user_stat;

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

dbe

2.11.6.1

-
-
- /

2.11.6.2

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

[2.1](#)

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
:

分片node1		
销售单(按日期拆分表1)		
流水号	顾客ID	日期
201712010001	1	20171201
201712010002	4	20171201

销售详情单	
流水号	商品ID
201712010001	1
201712010001	2
201712010002	7
201712010002	31

分片node2		
销售单(按日期拆分表2)		
流水号	顾客ID	日期
201712020001	15	20171202
201712020002	4	20171202

销售详情单	
流水号	商品ID
201712020001	103
201712020001	2304
201712020002	27
201712020002	91

ER

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

2.14.2 ER

2dbleERER

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

<!--rfunction-->
<function name="enum_par"
  class="com.actiontech.dble.route.function.PartitionByFileMap">
  <property name="mapFile">partition-hash-int.txt</property>
</function>
<function name="hash_function" class="com.actiontech.dble.route.function.PartitionByLong">
  <property name="partitionCount">2</property>
  <property name="partitionLength">512</property>
</function>
```

functionER

table	function

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

ER

```
<tableA.id_a , tableB.id_b, tableE.id_a >
<tableC.id_c>
<tableD.id_a>
<tableF.id_a>
```

PSschemaschemaERER.

2.15 global

“”“”

-
-
-

dble “”

-
-
- JOIN

JOIN

:



;

JOIN.

JOIN (SQL):

```

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

2.16 cache

cache 1.6

2.16.1

[sql,]

KEYpool.SQLRouteCache
VALUE cachefactoryname,

2.16.2 ER

[joinColumn,]

KEYpool.ER_SQL2PARENTID
VALUEcachefactoryname,

2.17

2.17.1

SQLSQL

2.17.2

dbledble

dbe: SQLdbeSQLdbeSQL
: MySQL

2.17.3 dble

dbeEXPLAINdbe1

```
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_two_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

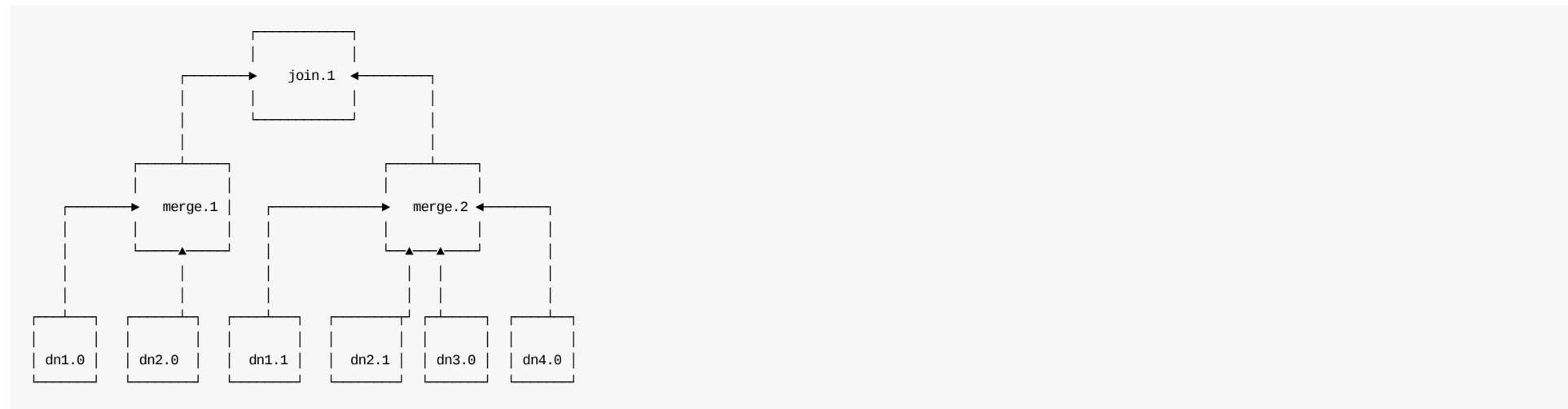
2.17.3.1

12

- **SHARDING_NODE**sharding.xmlshardingNodenamesql
- **TYPE** BASE_SQL ,
- **SQL/REF**SQL,SQL1limit 100

2.17.3.2

dble3join



- **SHARDING_NODE** sharding.xmlshardingNodenamesqlable
- **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_MERGEsqlselectdbbleLAST_INSERT_ID
- **SQI/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)
  
```

explain2sqlexplainshardingnodeexplainsql

2.18

- Btrace()
- managershow @@thread_used()

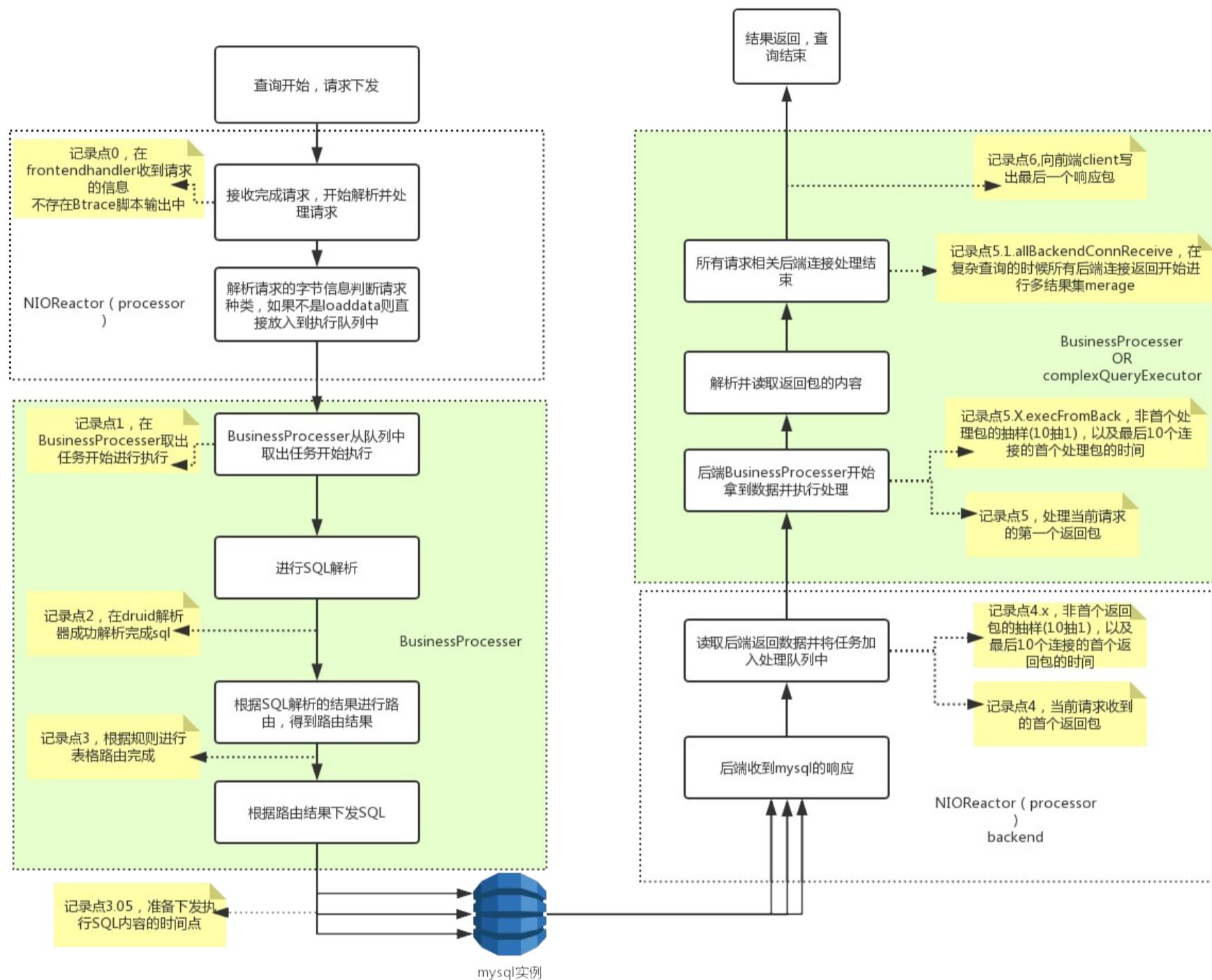
2.18.1 Btrace

2.18.1.1

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

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

bootstrap.cnfuseCostTimeStat costSamplePercent useCostTimeStat = 1 costSamplePercent 1% btrace



btraceable

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

Block, Invocations, WallTime. , SelfTime. btrace

2.18.1.2

- 0 : 0dble
- 1.startProcess :
- 2.endParse : SQL
- 3.endRoute : SQL
- 3.05 readyToDeliver : SQL
- 4.resFromBack :
- 4.X.resFromBack : ,4.3.resFromBackdble1
- 5.startExecuteBackend :
- 5.X.startExecuteBackend : 5.3.startExecuteBackend
- 5.1.allBackendConnReceive merge

- 6.response :

:BtraceSQLSQLSQL

2.18.1.3

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

2.18.2 Manager

2.18.2.1

Dble 18.02.0managerbootstrap.cnfuseThreadUsageStat
show @@thread_useddble

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

12 rows in set (0.00 sec)

- BussinessExecutorX
sqlmysql
- backendWorkerX
mysqclient
- \$_NIO_REACTOR_FRONT_X
,,BussinessExecutor
- \$_NIO_REACTOR_BACKEND_X
mysqlbackendWorker

2.18.2.2

80%

- NIOFrontRW_NIO_REACTOR_FRONT_X
- NIOBackendRW_NIO_REACTOR_BACKEND_X
- backendWorker backendWorkerX
- frontWorker BussinessExecutorX

2.19 reload

reload @@config_all dbGroupreload
dbGroup dbGroup dbGroup

2.19.1 reload @@config_all

:

2.19.1.1 dbGroup

,dbGroupschmea,

2.19.1.2 dbGroup

2.19.1.3 dbGroup

show backend

2.19.2 reload @@config_all -f

:

2.19.2.1 dbGroup

,dbGroup

2.19.2.2 dbGroup

2.19.2.3 dbGroup

2.19.3 reload @@config_all -r

dbGroup

show backend

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/mysql, 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_C
lient: 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_La
st_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_C
lient: 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_C
lient: 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_La
st_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] @ [0:0:0:0:0:0:1]  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] @ [0:0:0:0:0:0:1]  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  Ge
nerate_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] @ [0:0:0:0:0:0:1]  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_C
lient: 0.000443
SET timestamp=1535017212061;
delete from sharding_two_node where id =15;
# Time: 2018-08-23T17:40:12.091000Z
# User@Host: root[root] @ [0:0:0:0:0:0:1]  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_C
lient: 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_Fetch: 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_Fetch: 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_Fetch: 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_Fetch: 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_Fetch: 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: 0.021978 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_Fetch: 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_Fetch: 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_Fetch: 0.021938 dn1_Last_Result_Fetch: 0.000422 Write_Client: 0.000902
SET timestamp=1535017215321;

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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_Fetch: 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_Fetch: 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
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

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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_La
st_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 Gen
erate_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_C
lient: 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_C
lient: 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_La
st_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 Gen
erate_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_C
lient: 0.001433
SET timestamp=1535017220312;
delete from sharding_two_node where id =15;
# 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_C
lient: 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_La
st_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 Gen
erate_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_C
lient: 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_C
lient: 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_La
st_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 Gen
erate_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_C

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lient: 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_C
lient: 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_La
st_Result_Fetch: 0.000418  dn1_Last_Result_Fetch: 0.000655  Write_Client: 0.029031
SET timestamp=153501722220;
insert into sharding_two_node values(15,'15',15),(519,'519',519);
# Time: 2018-08-23T17:40:22.240000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id:  2
# Query_time: 0.019128  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0  Read_SQL: 0.000934  Prepare_Push: 0.002731  dn1_0_First_Result_Fetch: 0.013430  dn1_0_Last_Result_Fetch: 0.000521  dn2
_0_First_Result_Fetch: 0.003296  dn2_0_Last_Result_Fetch: 0.001243  Write_Client: 0.011072
SET timestamp=1535017222240;
select count(*) from sharding_two_node;
# Time: 2018-08-23T17:40:22.270000Z
# User@Host: root[root] @ [0:0:0:0:0:0:0:1] Id:  2
# Query_time: 0.028479  Lock_time: 0.000000 Rows_sent: 0  Rows_examined: 0  Read_SQL: 0.003233  Prepare_Push: 0.004986  dn1_0_First_Result_Fetch: 0.009870  dn1_0_Last_Result_Fetch: 0.001172  Gen
erate_New_Query: 0.001590  dn1_1_First_Result_Fetch: 0.006060  dn1_1_Last_Result_Fetch: 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_Fetch: 0.052343  dn1_Last_Result_Fetch: 0.000174  Write_C
lient: 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_Fetch: 0.006349  dn1_First_Result_Fetch: 0.009082  dn2_La
st_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_Fetch: 0.026156  dn2_Last_Result_Fetch: 0.000086  Write_C
lient: 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_Fetch: 0.025278  dn1_First_Result_Fetch: 0.025242  dn2_La
st_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  Gen
erate_New_Query: 0.001946  dn1_1_First_Result_Fetch: 0.008776  dn1_1_Last_Result_Fetch: 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_Fetch: 0.024084  dn1_Last_Result_Fetch: 0.000085  Write_C
lient: 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_Fetch: 0.017923  dn2_Last_Result_Fetch: 0.000092  Write_C
lient: 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_Fetch: 0.017241  dn1_First_Result_Fetch: 0.017320  dn2_La
st_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  dn
2_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  Gen
erate_New_Query: 0.001852  dn1_1_First_Result_Fetch: 0.005359  dn1_1_Last_Result_Fetch: 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_Fetch: 0.028241  dn1_Last_Result_Fetch: 0.000069  Write_C
lient: 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_Fetch: 0.023887  dn2_Last_Result_Fetch: 0.000102  Write_C
lient: 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_La
st_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_Fetch: 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   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
# Exec time  28 882ms 18ms 45ms 27ms 31ms 5ms 27ms
# 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  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      0:0:0:0:0:0:1
# 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
# Rows sent   0   0    0     0    0    0    0    0
# Rows examine 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      0:0:0:0:0:0:1
# 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
# Rows sent   0     0       0       0       0       0       0       0
# Rows examine  0     0       0       0       0       0       0       0
# Query size  9    494     38      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
# 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      0:0:0:0:0:0:1
# 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
# 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      0:0:0:0:0:0:1
# 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      0:0:0:0:0:0:1
# 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

mysqldumpslow5.6mysqldumpslow'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 changes schema

```
use nosharding;
```

1.6 set(mysqldumpslowSET 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/mysqld, 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
```

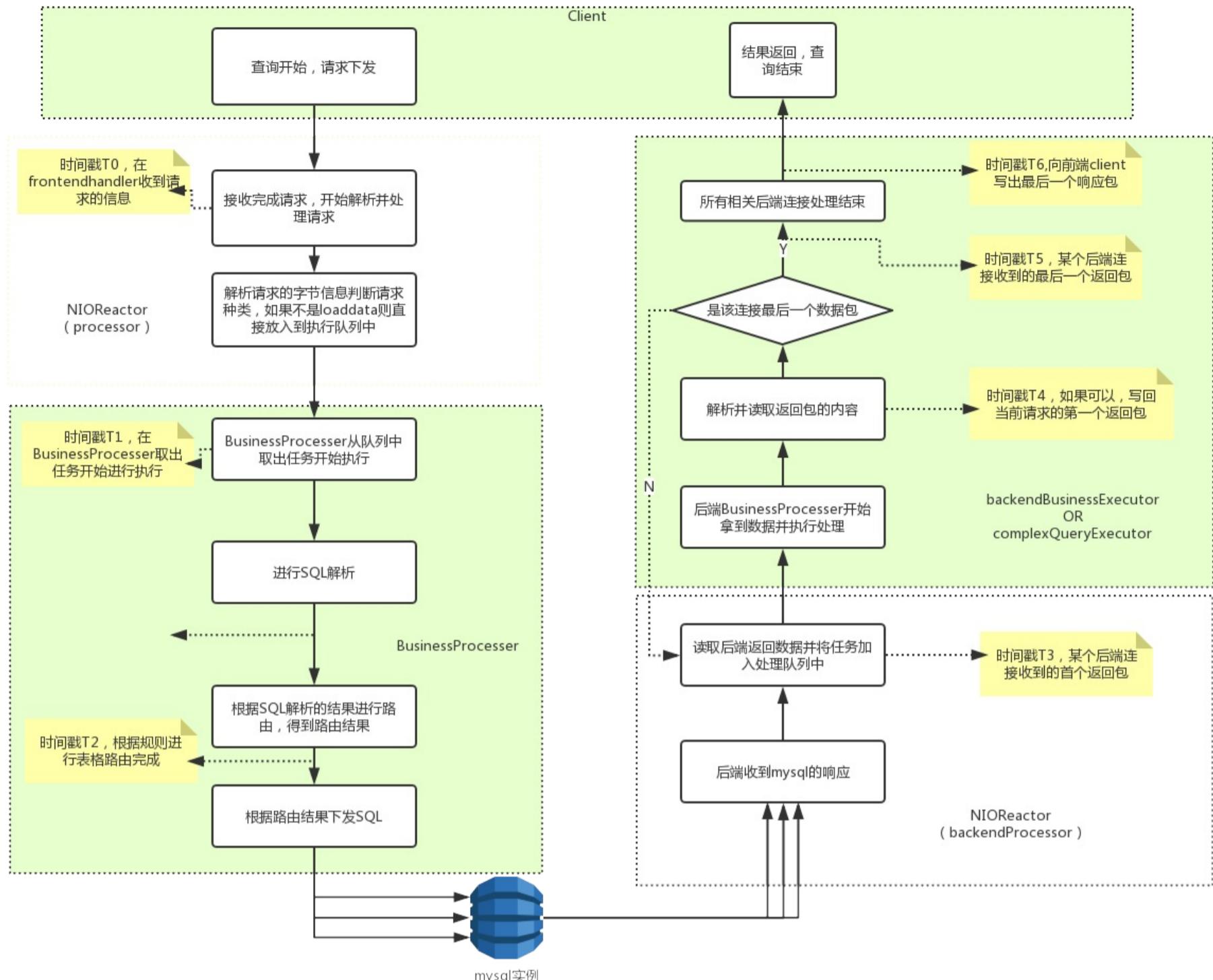
2.3 session

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

2.4

```
keyvalue.
```

```
dble
```



MySQL

Read_SQL: SQL SQL 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

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 profiledableSQLdbe 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. SQLtrace,,

```
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_two_node` LIMIT 100
| Fetch result | 9.091029 | 10.186782 | 1.095753 | dn1.0 | select COUNT(*) as `$_COUNT$_rpda_0` from `sharding_two_node` LIMIT 100
| Execute SQL | 1.237487 | 8.348635 | 7.111148 | dn2.0 | select COUNT(*) as `$_COUNT$_rpda_0` from `sharding_two_node` LIMIT 100
| Fetch result | 8.348635 | 9.342241 | 0.993606 | dn2.0 | select COUNT(*) as `$_COUNT$_rpda_0` from `sharding_two_node` LIMIT 100
| MERGE | 8.721543 | 10.289905 | 1.568362 | merge.1 | dn1.0; dn2.0
| ORDERED_GROUP | 8.726919 | 10.424309 | 1.69739 | ordered_group.1 | merge.1
| LIMIT | 9.020162 | 10.499574 | 1.479412 | limit.1 | ordered_group.1
| SHUFFLE_FIELD | 9.023584 | 10.501529 | 1.477945 | shuffle_field.1 | limit.1
| Write to Client | 9.072457 | 11.52055 | 2.448093 | - | -
| Over All | 0.0 | 11.52055 | 11.52055 | - | -
+-----+-----+-----+-----+-----+
14 rows in set (0.03 sec)
```

7. trace

```
mysql> select count(*) from sharding_two_node where id =(select id from sharding_two_node where id=1);
+-----+
| COUNT(*) |
+-----+
| 1 |
+-----+
1 row in set (0.03 sec)

mysql> show trace;
+-----+-----+-----+-----+-----+
| OPERATION | START(ms) | END(ms) | DURATION(ms) | SHARDING_NODE | SQL/REF
+-----+-----+-----+-----+-----+
| Read SQL | 0.0 | 0.063047 | 0.063047 | - | -
| Parse SQL | 0.063047 | 0.491182 | 0.428135 | - | -
| Try Route Calculation | 0.491182 | 0.799576 | 0.308394 | - | -
| Try to Optimize | 0.799576 | 2.347412 | 1.547836 | - | -
| Execute SQL | 2.347412 | 11.183808 | 8.836396 | dn1.0 | select `sharding_two_node`.`id` as `autoalias_scalar` from `sharding_two_node` where id = 1 LIMIT 2
| Fetch result | 11.183808 | 12.360691 | 1.176883 | dn1.0 | select `sharding_two_node`.`id` as `autoalias_scalar` from `sharding_two_node` where id = 1 LIMIT 2
| MERGE | 11.889546 | 12.436445 | 0.546899 | merge.1 | dn1.0
| LIMIT | 11.894923 | 12.483364 | 0.588441 | limit.1 | merge.1
| SHUFFLE_FIELD | 11.896389 | 12.48483 | 0.588441 | shuffle_field.1 | limit.1
| SCALAR_SUB_QUERY | 12.038123 | 12.485808 | 0.447685 | scalar_sub_query.1 | shuffle_field.1
| 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 metakey dble table 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

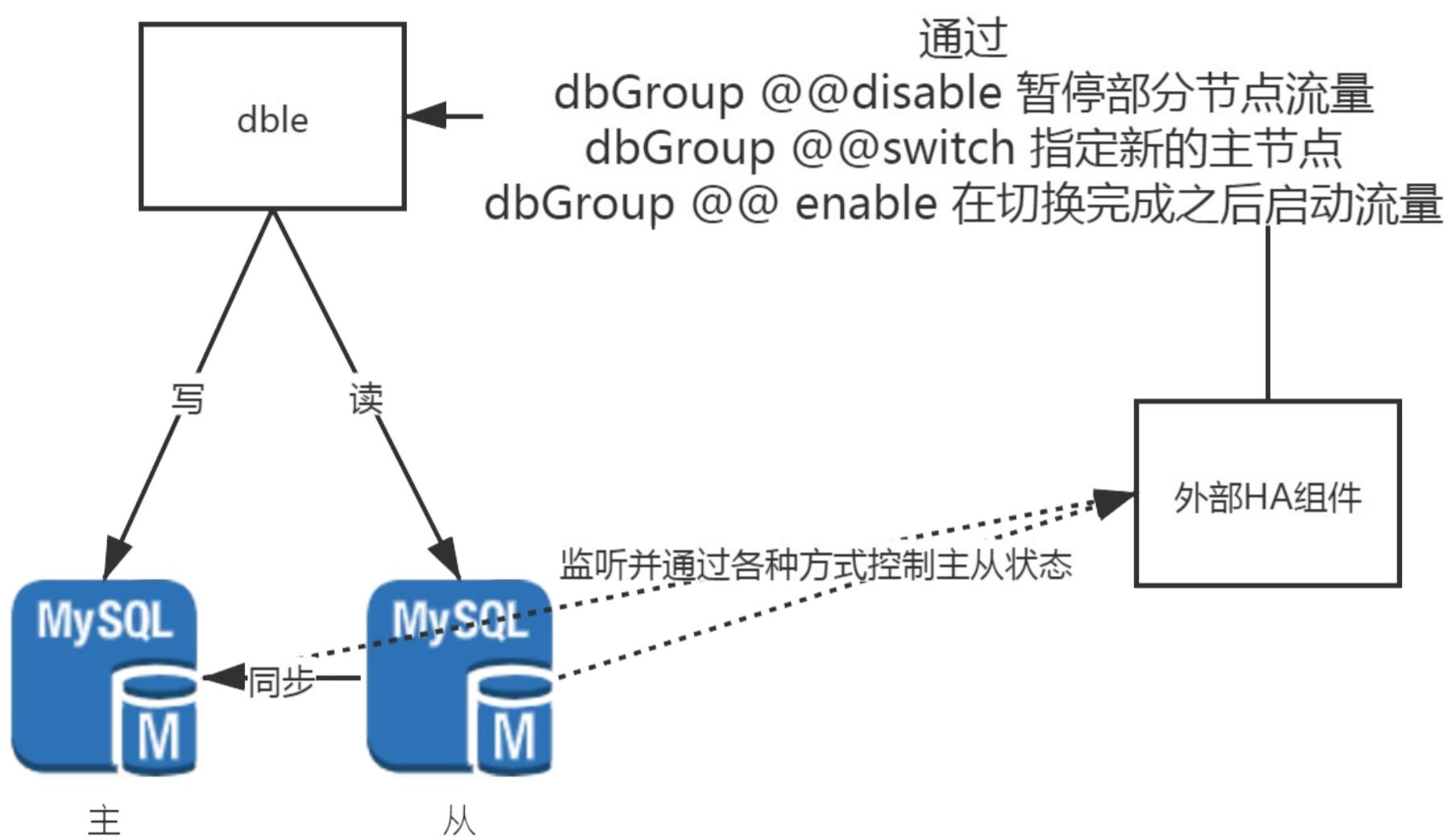
- (dbGroup @@disable)
- (dbGroup @@enable)
- (dbGroup @@switch)

:

- (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.cnfneedSyncHatruedbledbledble

dble

dbleMySQL

dbInstance“disabled/enable”dbleMySQLMySQL

dbGroup @@disable

dbGroup @@disable name = 'dbGroup_name' [instance = 'instance_name']

- dbGroup_namedb.xmldbGroupinstance_namedbInstancename
- instance = '..'dbGroupdbInstancedisable
- 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

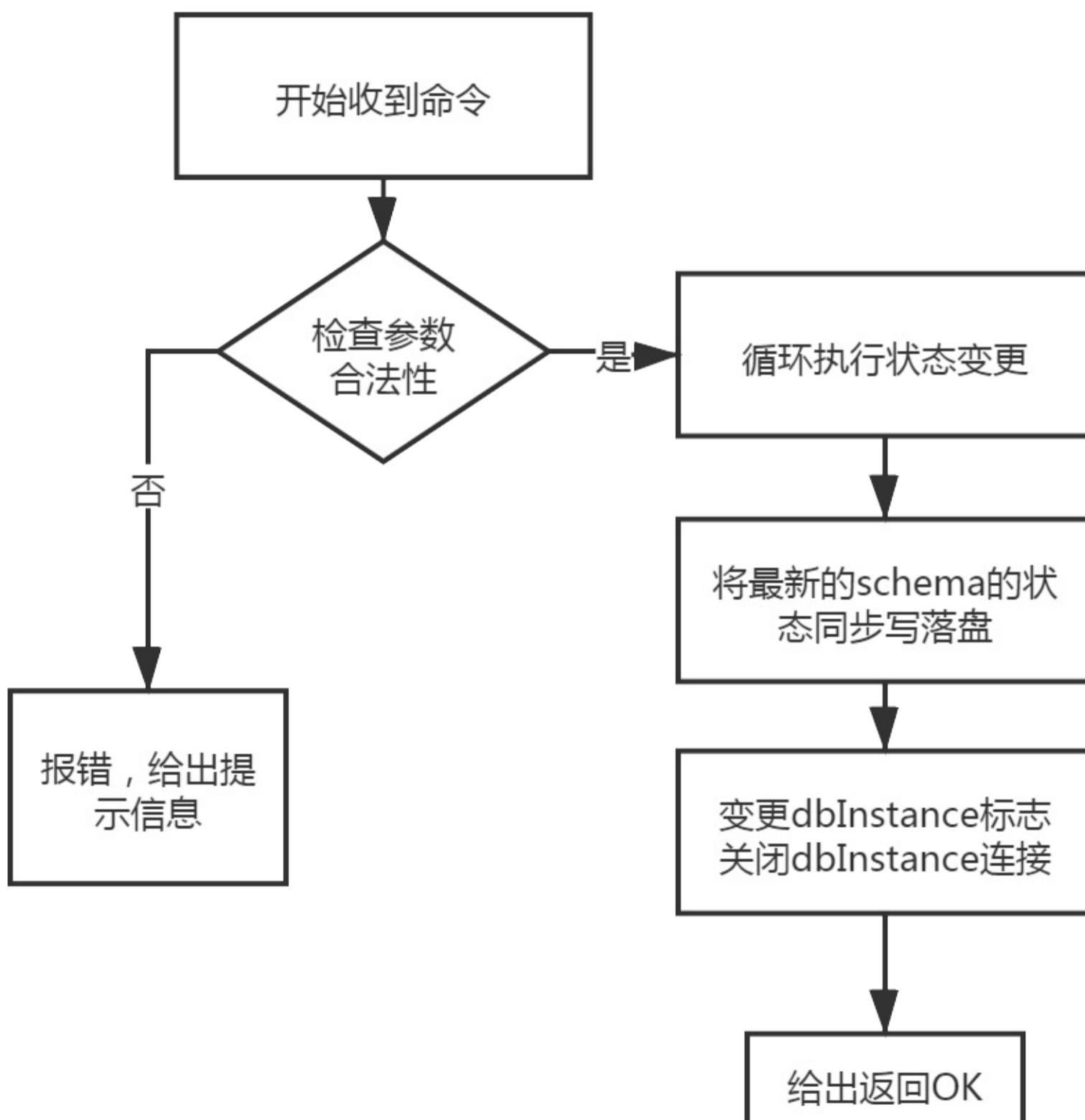
dbledbGroup

- disablezk
- enable
- switchprimary dbInstance

dbGroup @@disable

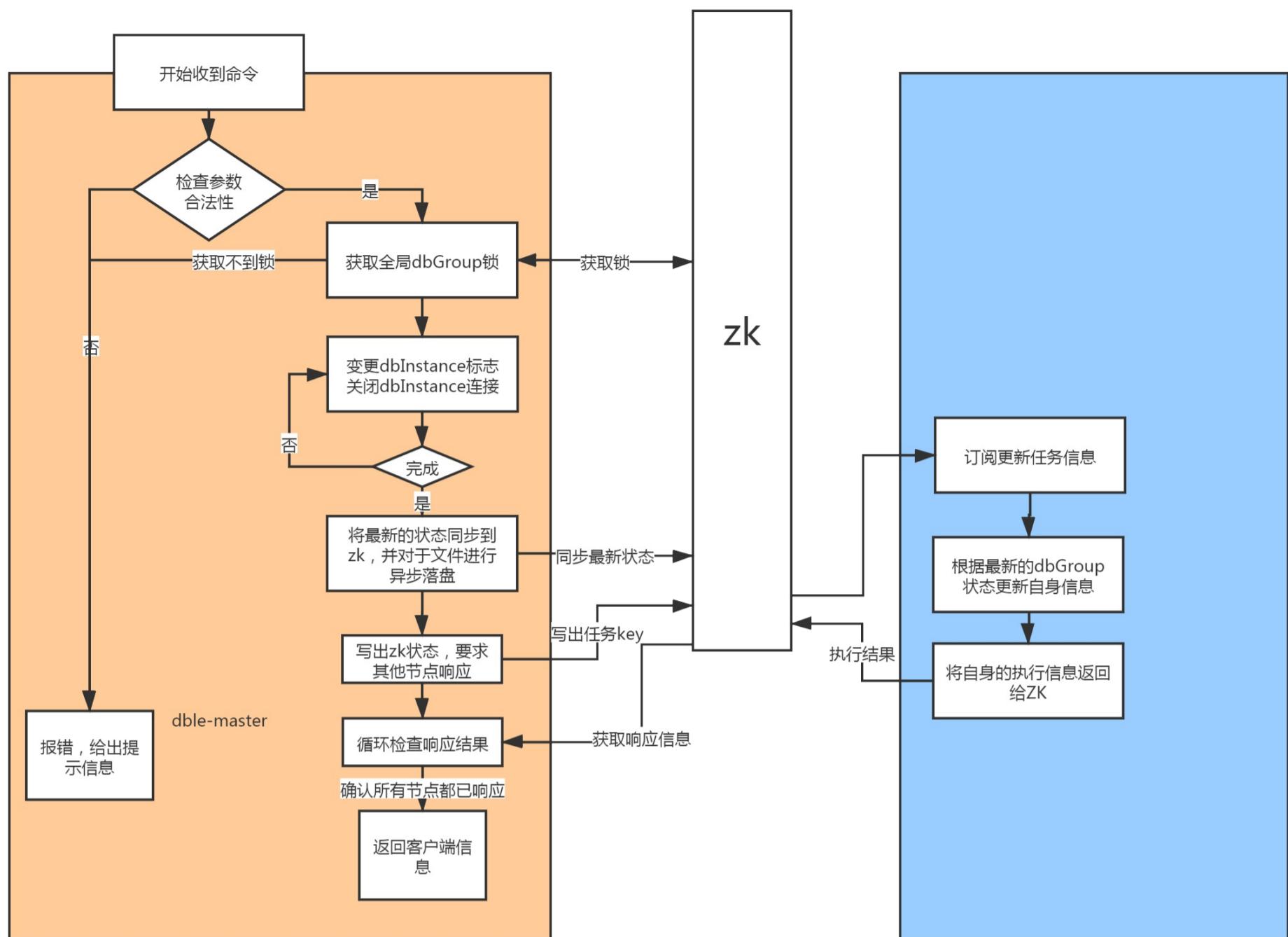
dble

-
- dbInstance
-
- dbGroup
- OK



-
- dbInstance
-
- dbGroup
- dbGroupzk
- zkkey
-

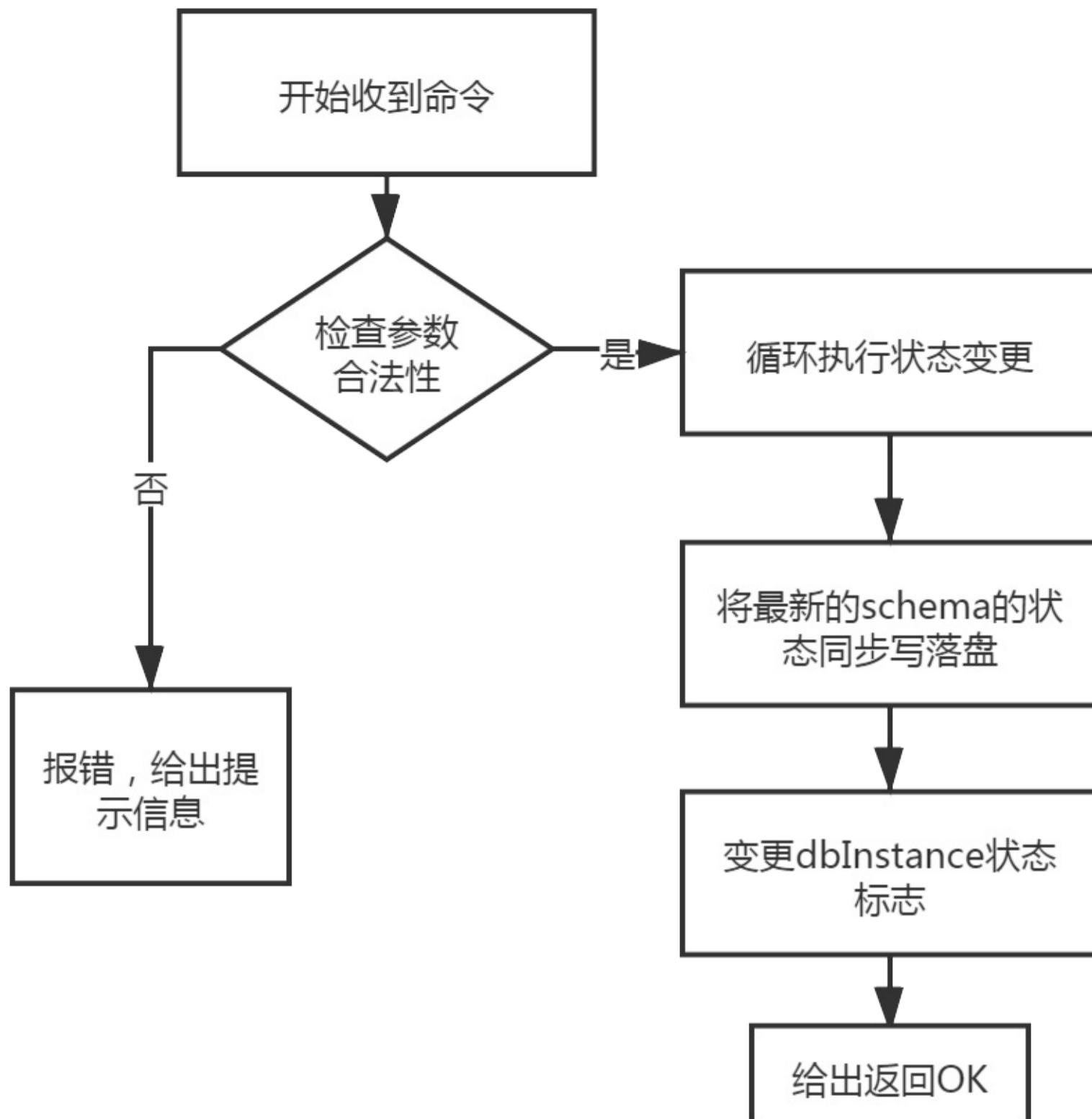
- dble
-



dbGroup @@enable

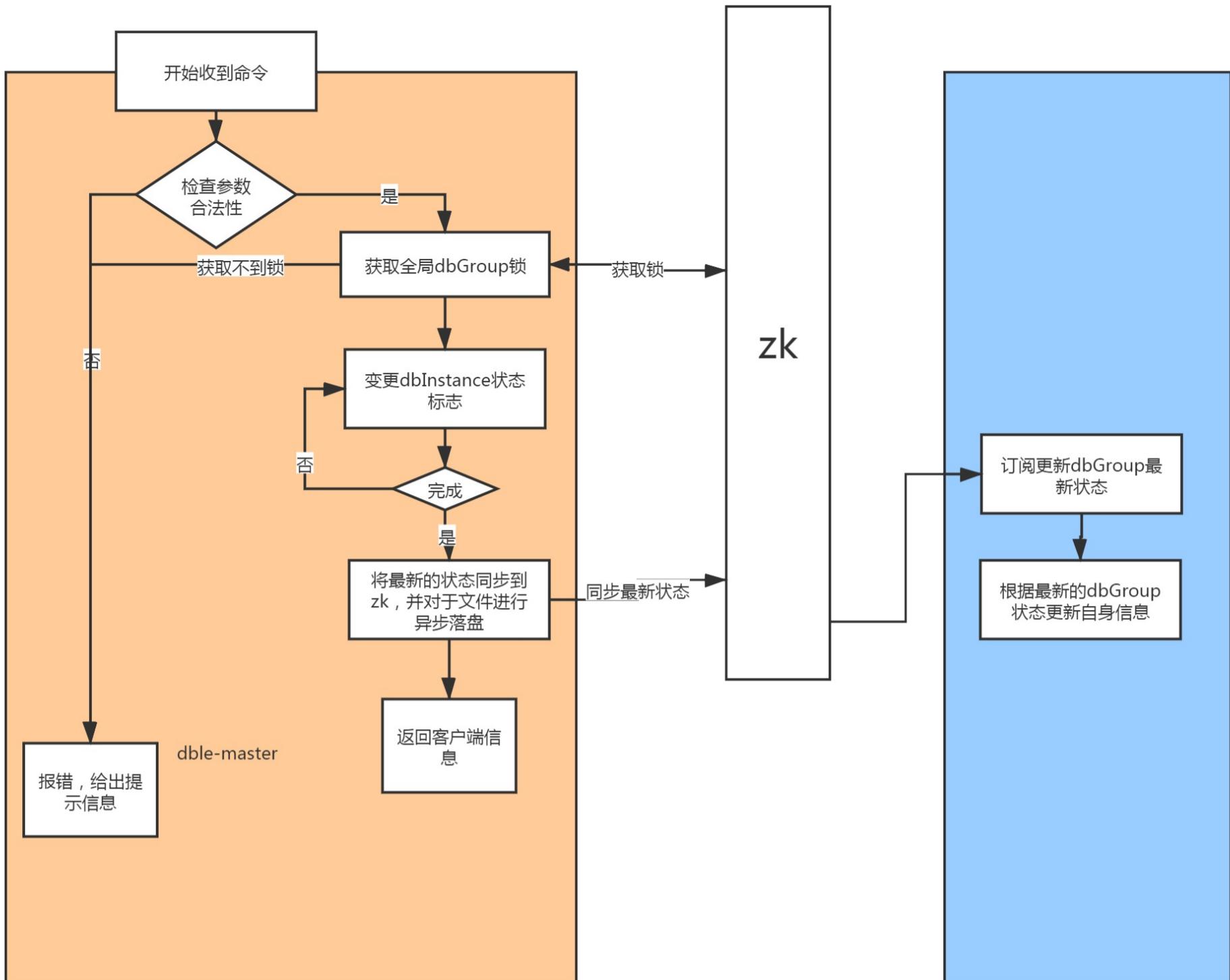
dble

-
- dbInstance
- dbGroup
- OK



ZK

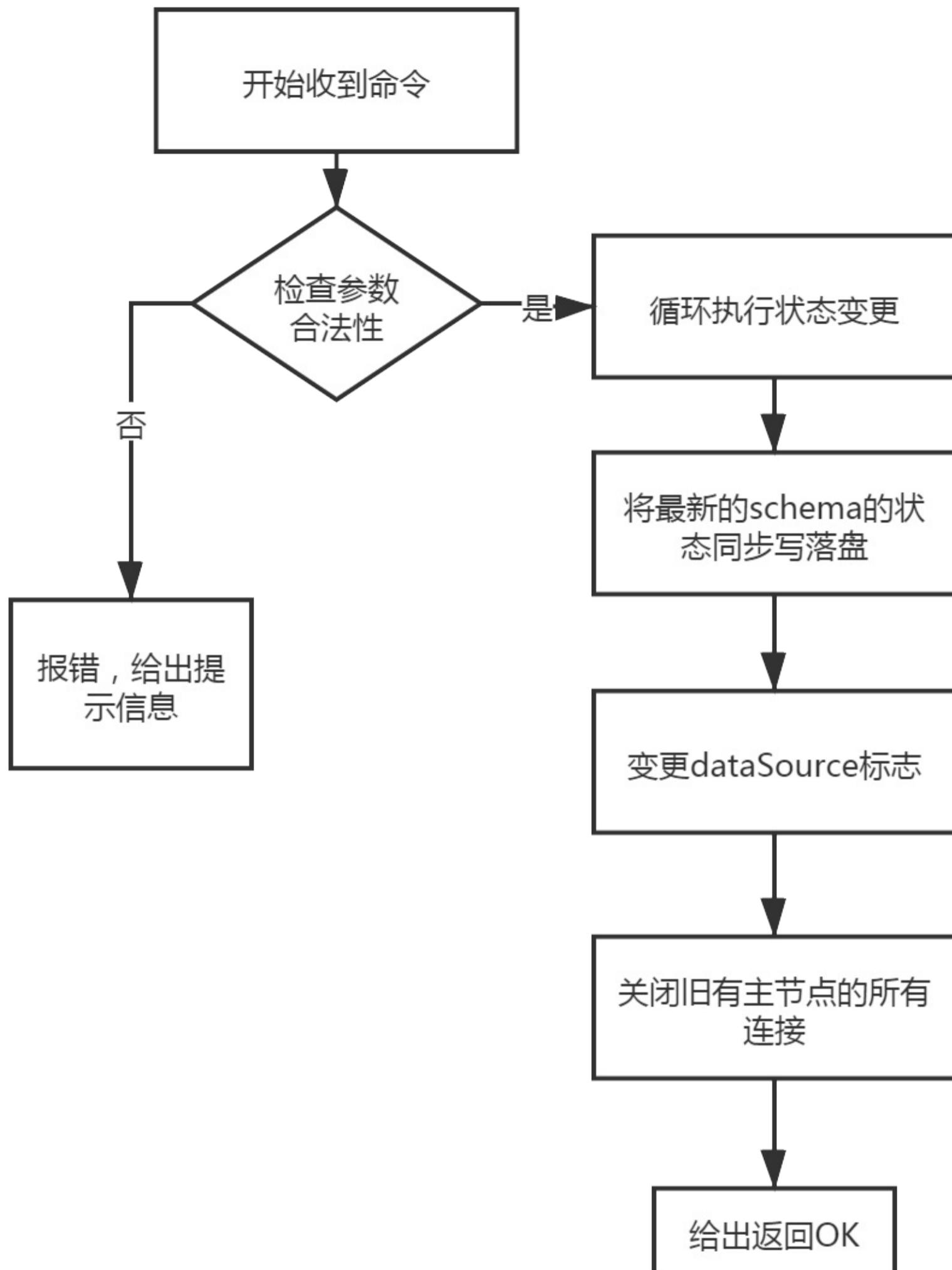
-
- ddbInstance
-
- dbGroup
- dbGroupzk
- zkkey
-
- dble
-



dbGroup @@switch

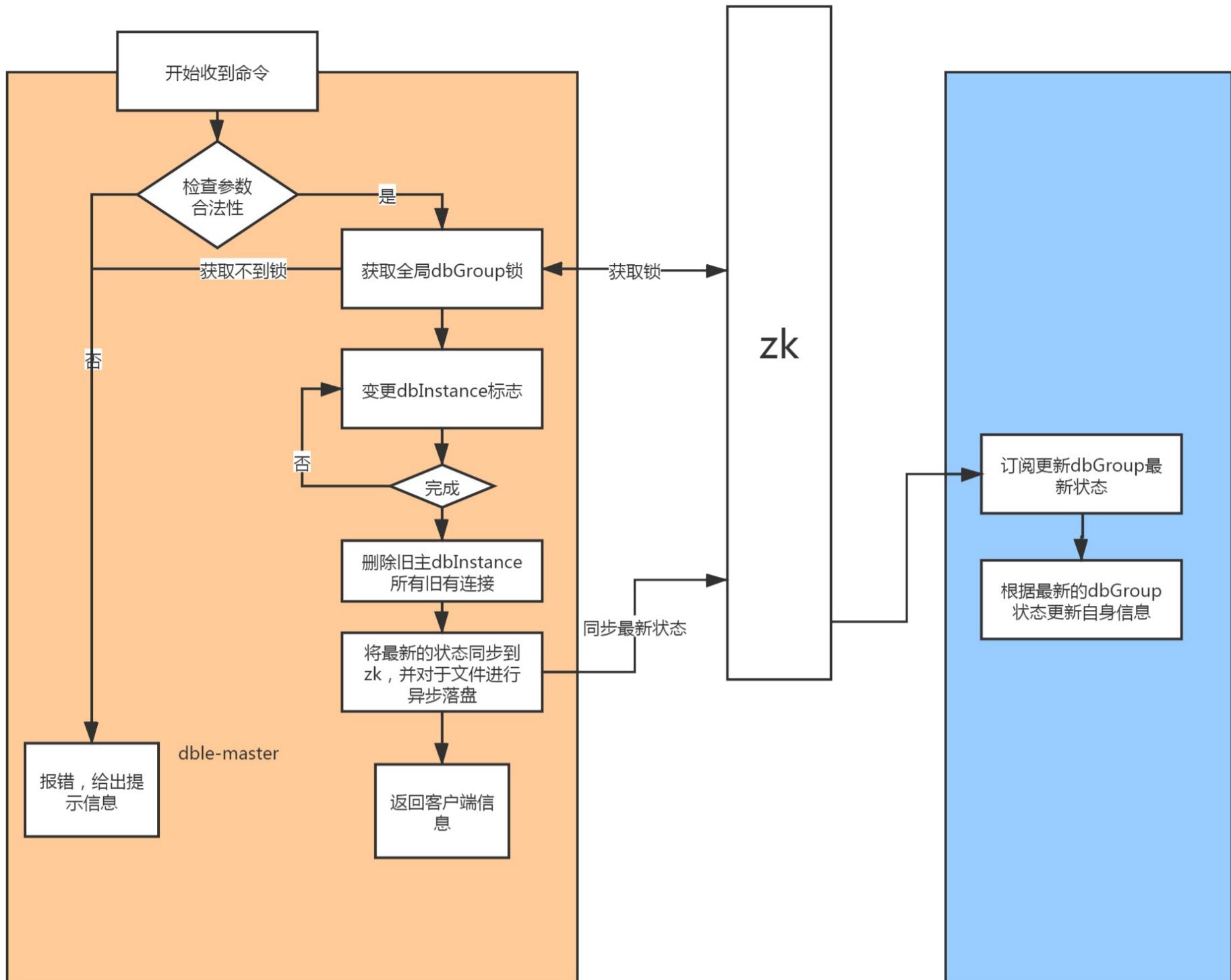
dble

-
- dbInstance
- primary dbInstance
- dbGroup
- OK



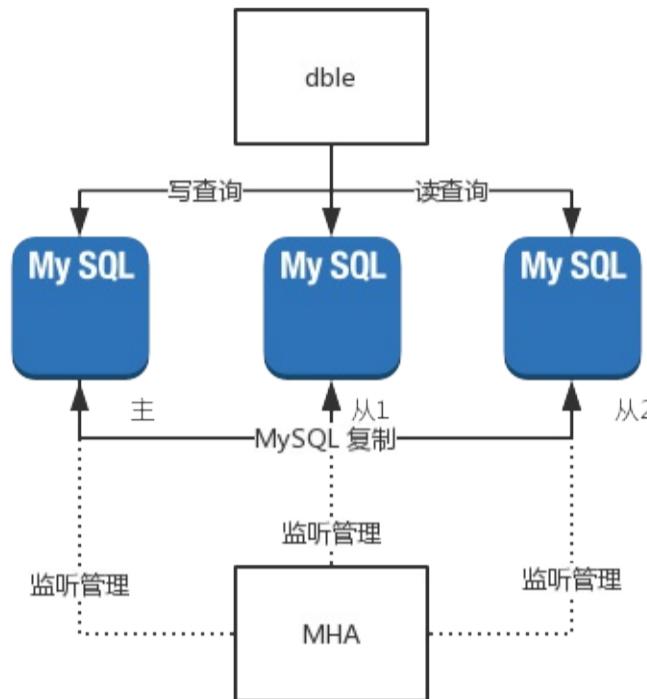
ZK

- dbInstance
- dbGroup
- dbGroupzk
- zkkey
- dble

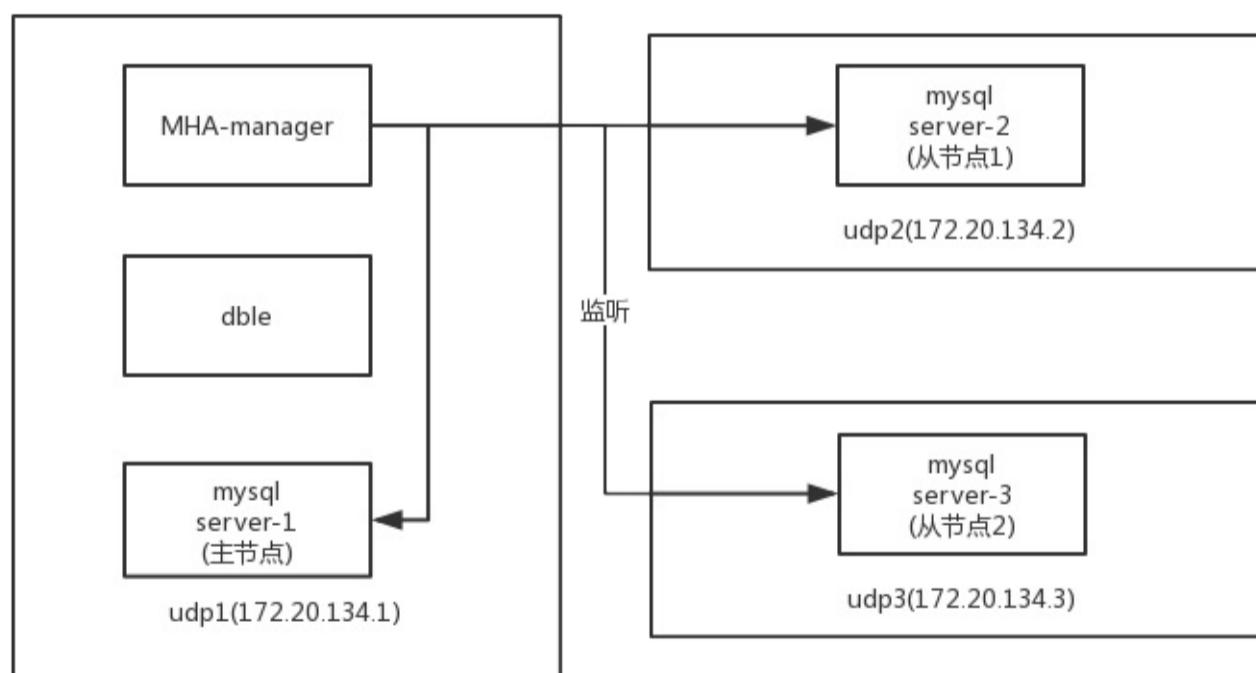


2.23.4 mha-dble

dbleMySQLLdbGroupMHAMySQL



docker



- MySQL()
- MHAMySQL
- dbleMySQL
- kill MySQLMHA
- dbleMySQL

- dble2.19.09.0
- MHAdble

dockermysqld()

mha

- dockersh

```
/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/mysqlyummysql

- 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
yumrpmyum
```

mhap erlmhamhamaster_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 masterdbGroup disablestop dbledbGroup @@disable
- MySQL masterstartdbGroup @@switchmasterdbGroup

master_ip_failover()

```
#!/usr/bin/env perl

# Copyright (C) 2011 DeNA Co.,Ltd.
#
# This program is free software; you can redistribute it and/or modify
# it under the terms of the GNU General Public License as published by
# the Free Software Foundation; either version 2 of the License, or
# (at your option) any later version.
#
# This program is distributed in the hope that it will be useful,
# but WITHOUT ANY WARRANTY; without even the implied warranty of
# MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
# GNU General Public License for more details.
#
# You should have received a copy of the GNU General Public License
# along with this program; if not, write to the Free Software
# Foundation, Inc.,
# 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

## Note: This is a sample script and is not complete. Modify the script based on your environment.

use strict;
use warnings FATAL => 'all';

use Getopt::Long;
use MHA::DBHelper;

my (
    $command,           $ssh_user,           $orig_master_host,
    $orig_master_ip,   $orig_master_port,  $new_master_host,
    $new_master_ip,    $new_master_port,   $new_master_user,
    $new_master_password
);
GetOptions(
    'command=s'          => \$command,
    'ssh_user=s'         => \$ssh_user,
```

```
'orig_master_host=s' => \$orig_master_host,
'orig_master_ip=s' => \$orig_master_ip,
'orig_master_port=i' => \$orig_master_port,
'new_master_host=s' => \$new_master_host,
'new_master_ip=s' => \$new_master_ip,
'new_master_port=i' => \$new_master_port,
'new_master_user=s' => \$new_master_user,
'new_master_password=s' => \$new_master_password,
);

exit &main();

sub main {
    if ( $command eq "stop" || $command eq "stopssh" ) {

        # $orig_master_host, $orig_master_ip, $orig_master_port are passed.
        # If you manage master ip address at global catalog database,
        # invalidate orig_master_ip here.
        my $exit_code = 1;
        eval {

            # dbGroup @@disable name = "dbGroup1" instance='\$orig_master_host'
            # disable
            $orig_master_host =~ tr/.//_;
            system "mysql -P9066 -u man1 -p654321 -h 172.20.134.1 -e \"dbGroup @@disable name = 'dbGroup1' instance='".$orig_master_host."'\"";
            $exit_code = 0;
        };
        if ($@) {
            warn "Got Error: $@\n";
            exit $exit_code;
        }
        exit $exit_code;
    }
    elsif ( $command eq "start" ) {

        # all arguments are passed.
        # If you manage master ip address at global catalog database,
        # activate new_master_ip here.
        # You can also grant write access (create user, set read_only=0, etc) here.
        my $exit_code = 10;
        eval {
            my $new_master_handler = new MHA::DBHelper();

            # args: hostname, port, user, password, raise_error_or_not
            $new_master_handler->connect( $new_master_ip, $new_master_port,
                $new_master_user, $new_master_password, 1 );

            ## Set read_only=0 on the new master
            $new_master_handler->disable_log_bin_local();
            print "Set read_only=0 on the new master.\n";
            $new_master_handler->disable_read_only();

            ## Creating an app user on the new master
            print "Creating app user on the new master..\n";
            $new_master_handler->enable_log_bin_local();
            $new_master_handler->disconnect();

            ## try to switch the dbGroup master into new master
            ## dbGroup switchnew_master_host
            $new_master_host =~ tr/.//_;
            system "mysql -P9066 -u man1 -p654321 -h 172.20.134.1 -e \"dbGroup @@switch name = 'dbGroup1' master='".$new_master_host."'\"";
            $exit_code = 0;
        };
        if ($@) {
            warn $@;

            # If you want to continue failover, exit 10.
            exit $exit_code;
        }
        exit $exit_code;
    }
    elsif ( $command eq "status" ) {
        # test for start command
        exit 0;
    }
    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="100">
  <heartbeat>show slave status</heartbeat>
  <dbInstance name="172_20_134_1" url="172.20.134.1:3306" password="123456" user="root" disabled="false" id="udp-1" primary="true" />
  <dbInstance name="172_20_134_2" url="172.20.134.2:3306" password="123456" user="root" disabled="false" id="udp-3" />
  <dbInstance name="172_20_134_3" url="172.20.134.3:3306" password="123456" user="root" disabled="false" id="udp-2" />
</dbGroup>

```

dbleman1dble

```

MySQL [(none)]> show @@dbinstance;
+-----+-----+-----+-----+-----+-----+-----+-----+
| DB_GROUP | NAME      | HOST      | PORT | W/R | ACTIVE | IDLE | SIZE | EXECUTE | READ_LOAD | WRITE_LOAD | DISABLED |
+-----+-----+-----+-----+-----+-----+-----+-----+
| dbGroup1 | 172_20_134_1 | 172.20.134.1 | 3306 | W   | 1 | 0 | 1000 | 1 | 0 | 0 | false |
| dbGroup1 | 172_20_134_3 | 172.20.134.3 | 3306 | R   | 1 | 0 | 1000 | 0 | 0 | 0 | false |
| dbGroup1 | 172_20_134_2 | 172.20.134.2 | 3306 | R   | 1 | 0 | 1000 | 0 | 0 | 0 | false |
+-----+-----+-----+-----+-----+-----+-----+-----+

```

172.20.134.1“”

- ps172.20.134.1mysqld
- kill -9 172.20.134.1mysqld
- dble

```

MySQL [(none)]> show @@dbinstance;
+-----+-----+-----+-----+-----+-----+-----+-----+
| DB_GROUP | NAME      | HOST      | PORT | W/R | ACTIVE | IDLE | SIZE | EXECUTE | READ_LOAD | WRITE_LOAD | DISABLED |
+-----+-----+-----+-----+-----+-----+-----+-----+
| dbGroup1 | 172_20_134_2 | 172.20.134.2 | 3306 | W   | 1 | 0 | 1000 | 0 | 0 | 0 | false |
| dbGroup1 | 172_20_134_3 | 172.20.134.3 | 3306 | R   | 1 | 0 | 1000 | 0 | 0 | 0 | false |
| dbGroup1 | 172_20_134_1 | 172.20.134.1 | 3306 | R   | 0 | 0 | 1000 | 0 | 0 | 0 | true  |
+-----+-----+-----+-----+-----+-----+-----+-----+

```

- dble,172_20_134_2

```

<dbGroup name="dbGroup1" delayThreshold="100">
  <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>

```

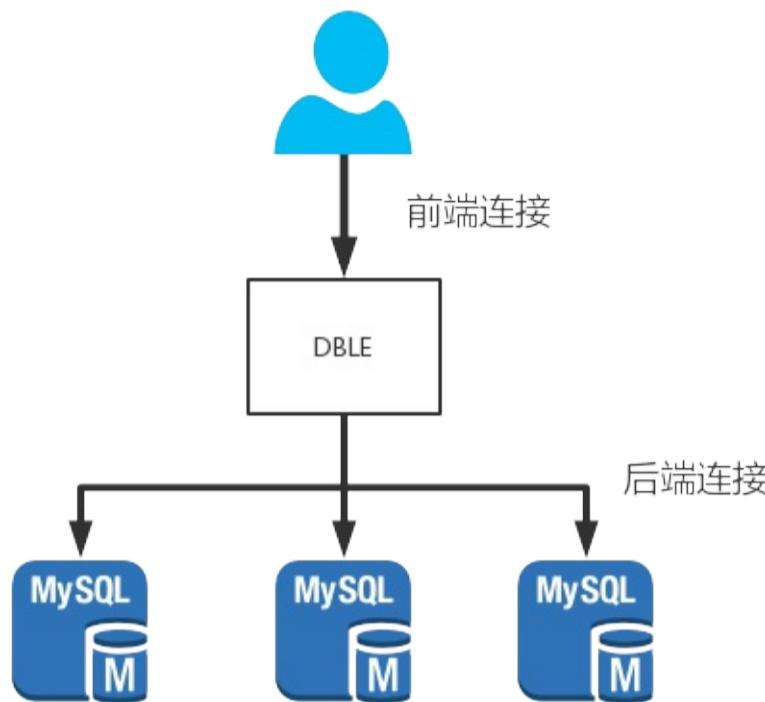
- 172.20.134.3mysql172.20.134.2dble

```
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 /

dbledblemysql



TCPdbledble dble

bootstrap.cnf

- sqlExecuteTimeout()
- idleTimeout
- processorCheckPeriod

- dblep rocessorCheckPeriod
- - - sqlExecuteTimeout
 - DDLxa
- - xacommit/rollback
 - idleTimeout

- DDL,XAsqlExecuteTimeout
- XAidleTimeoutloaddata

SQL

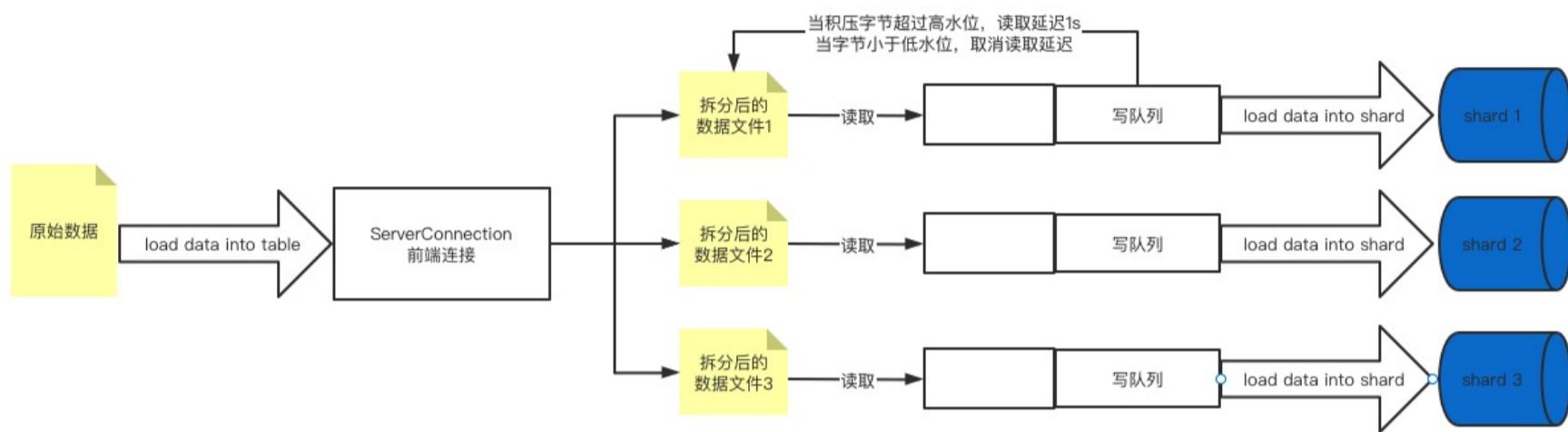
-
- SQL
- load dataidleTimeoutidleTimeout
- processorCheckPeriodSQL

2.25 dble

dbleloaddbdbleOOM
2.20.04@ssxlulu/load

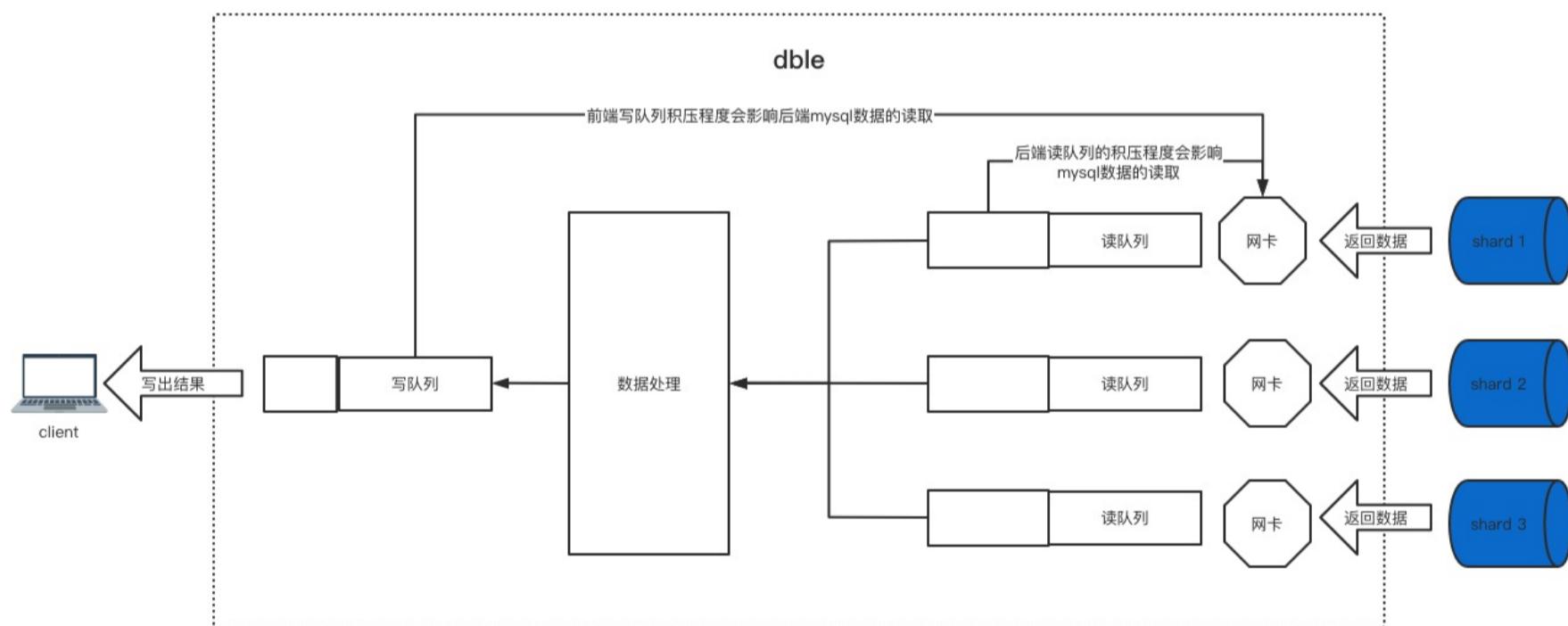
dble

- Load data
 - (flowHighLevel)(flowLowLevel)



- Select

- ()(flowControlHighLevel),MySQL
- MySQL(mysql),(flowHighLevel)mysql
- (flowControlLowLevel)(flowLowLevel),mysql
-



,nio

bootstrap.cnf bootstrap.cnf

```
enableFlowControl()
flowControlHighLevelbootstrap()
flowControlLowLevel()
```

- `flow_control @@set [enableFlowControl = true/false] [flowControlHighLevel = ?] [flowControlLowLevel = ?]`
- `flowLowLevelflowHighLevelbootstrap.cnfenableFlowControl`
- - `flow_control @@show`.
- :
 - `flow_control @@list`
 - `dble_information.dble_flow_control flow_control @@list`

2.26 /client_found_rows

2.26.1 &

DBLEdbclient_found_rows

2.26.1.1 client_found_rows

handshakeclient_found_rowsDML(found rows)(affect rows)

2.26.1.2 client_found_rows

MYSQLclient_found_rowaffect rows
JDBCclient_found_rowsfound rows

2.26.1.3 JDBCuseAffectedRowsclient_found_row

useAffectedRows=true client_found_rows
useAffectedRows=false() client_found_rows

2.26.2

2.26.2.1 bootstrap.cnf

```
#client_found_rows
-DcapClientFoundRows=false
```

2.26.2.2

```
show @@cap_client_found_rows; -- client_found_row 0- 1
disable @@cap_client_found_rows; -- client_found_row
enable @@cap_client_found_rows; -- client_found_row
```

dblemysql() insert

2.26.3

step1. dble(client_found_rows)

step2. client_found_rows

```
mysql -uman1 -h192.xx.xx.xx -P9066 -p654321
enable @@cap_client_found_rows;
```

step3.

- 3.20.10.0dbleclient_found_rows

```
mysql -uroot -h192.xx.xx.xx -P8066 -p123456
ERROR 1045 (HY000): The client requested CLIENT_FOUND_ROWS capabilities does not match, in the manager use show @@cap_client_found_rows check latest status.
```

- 3.20.10.1dble.logdbleclient_found_rowsdbleclient_found_rows

```
the client requested CLIENT_FOUND_ROWS capabilities is 'found rows', dble is configured as 'affect rows', pls set the same.
or
the client requested CLIENT_FOUND_ROWS capabilities is 'affect rows', dble is configured as 'found rows', pls set the same.
```

2.27 general

2.27.1

```
generaldblesql()file 3%5%sql
```

- 1.Executedblelong data16general
- 2.Executesqlsql

2.27.2 bootstrap.cnfgeneral log

```
# dble/tmp/
-DhomePath=.

# general long0-1-
#-DenableGeneralLog=1

# general loggeneral/general.log'/'homepath
# general/general.log/tmp/general/general.log
# /general/general.log/general/general.log
#-DgeneralLogFile=general/general.log

# 16mb16MBgeneral.logyyy-MM/general-MM-dd-%d.log
#-DgeneralLogFileSize=16

# 24096
#-DgeneralLogQueueSize=4096
```

2.27.3

2.27.3.1 show @@general_log

```
generaluse dble_information; select * from dble_variables where variable_name like '%general%';
```

```
show @@general_log;
+-----+-----+
| NAME      | VALUE          |
+-----+-----+
| general_log | ON            |
| general_log_file | /tmp./general/general.log |
+-----+
2 rows in set (0.03 sec)
```

2.27.3.2 disable @@general_log

```
general log
```

```
disable @@general_log;
Query OK, 1 row affected (0.02 sec)
disable general_log success
```

2.27.3.3 enable @@general_log

```
general log
```

```
enable @@general_log;
Query OK, 1 row affected (0.02 sec)
enable general_log success
```

2.27.3.4 reload @@general_log_file=?

```
general log
```

```
reload @@general_log_file='/tmp/dble-general/general/general.log';
Query OK, 1 row affected (0.00 sec)
reload general log path success
```

2.28 sql

2.28.1

```
dblesql(CRUD)()
sqldblesql
5%15%()querystatisticQueueSize
prometheusdble
```

2.28.2 bootstrap.cnfsql

```
# statistic0-1-
#-DenableStatistic=1

# 1024
 #-DassociateTablesByEntryByUserTableSize=1024
 #-DfrontendByBackendByEntryByUserTableSize=1024
 #-DtableByUserByEntryTableSize=1024

# 24096
 #-DstatisticQueueSize=4096

# 0[0,100] %
 #-DsamplingRate=0

# sql_log
 #-DsqlLogTableSize=1024
```

2.28.3

2.28.3.1 show @@statistic

statistic

```
show @@statistic;
+-----+-----+
| NAME          | VALUE |
+-----+-----+
| statistic      | 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)
```

2.28.4

```
:
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(rollback)

rwsplit:

- sql1064
- multi-query(sql,mysql client delimiter)multi-querysql(commit)

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 @@statisticqueueMonitorMonitoring)(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 data load data"“bootstrap.cnf load data load data DBLE load data load data DBLE load data sql load data
:
1. kill @@load_data/temp/error
2.
3.
4.---.txt1-data-table-dn1.txt1data table dn1
```

2.29.2 bootstrap.cnf load 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

- sql


```
explain select a.* from gtest a where 1=1 and a.id in (select b.id from test b) order by a.id;
```
- inSubQueryTransformToJoin = true in

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

testgtest 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.
inSubQueryTransformToJoin = truejoinmysql inSubQuery TransformToJoin = falsesubQuerysqlsubQuerymysqljoinsubQuery

conditions

- Column
- join
- having
- order by
- where
-
- inwheredble

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

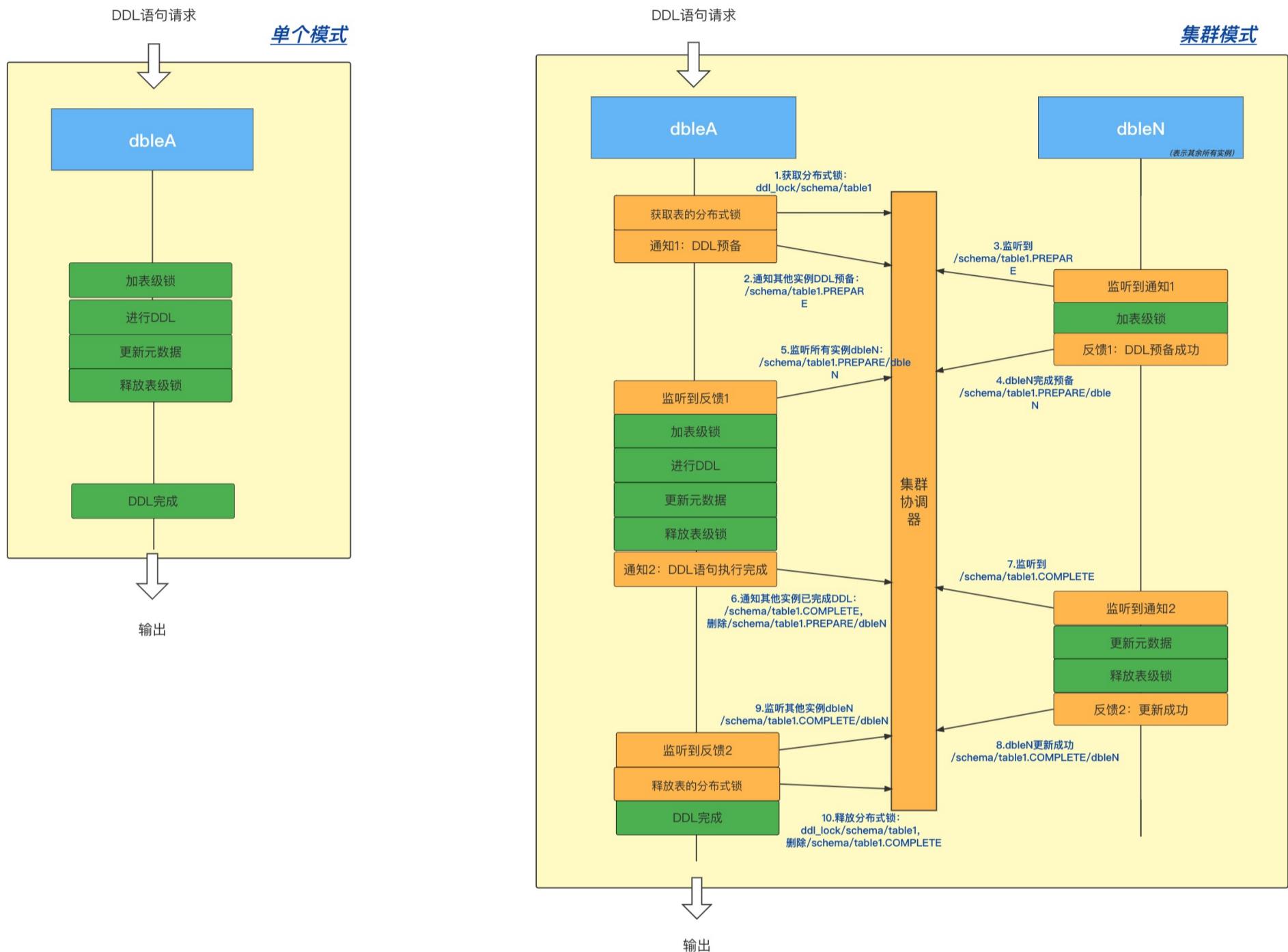
- select * from sharding_4_t1 where id!=any(select id from test where age=1) order by name desc;
- select * from sharding_4_t1 where id=all(select id from test where age=1) order by name desc;

in

2.31 DDL

>=3.22.01

DDL



[DDL_{id}{.}] <{{.}}> {}

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 0		[DDL_2] notice_cluster_ddl_prepare.start /*ddl.PREPARE*/	[DDL_NOTIFIED] receive_ddl_prepare /*ddl.PREPARE*/
			[DDL_NOTIFIED] add_table_lock.start /**/
			[DDL_NOTIFIED] add_table_lock.succ /**/
		[DDL_2] notice_cluster_ddl_prepare.succ /*ddl.PREPARE*/	
		[DDL_2] add_table_lock.start /**/	

	[DDL_2] add_table_lock.succ /**/	
test_ddl_conn 'select 1'; (tableB)	[DDL_2] test_ddl_conn.start /* */	
	[DDL_2.dn1] test_ddl_conn.start /*dn1 */	
	[DDL_2.dn1] test_ddl_conn.get_conn /*dn1dn2~4 */	
	[DDL_2.dn1] test_ddl_conn.succ /*dn1select 1dn2~4 */	
	[DDL_2] test_ddl_conn.succ /*select 1dn2~4 */	
exec_ddl_sql ddl	[DDL_2] exec_ddl_sql.start /*sql */	
	[DDL_2.dn1] exec_ddl_sql.start /*dn1ddldn2~4 */	
	[DDL_2.dn1] exec_ddl_sql.get_conn /*dn1dn2~4*/	
	[DDL_2.dn1] exec_ddl_sql.succ /*dn1ddldn2~4*/	
update_table_metadata	[DDL_2] update_table_metadata.start /**/	
	[DDL_2] update_table_metadata.succ /**/	
notice_cluster_ddl_complete DDL 0	[DDL_2] notice_cluster_ddl_complete.start /*ddl.COMPLETE*/	
		[DDL_NOTIFIED] receive_ddl_complete /*ddl.COMPLETE*/
		[DDL_NOTIFIED] update_table_metadata.start /**/
		[DDL_NOTIFIED] update_table_metadata.succ /**/
		[DDL_NOTIFIED] release_table_lock.succ /**/
release_table_lock	[DDL_2] release_table_lock.succ /**/	
finish_ddl_trace DDL	[DDL_2] finish_ddl_trace	

succ	
fail	
get_conn	

dbleAdbleN()dbleASQL1

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.bn2] <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.bn1] <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.bn1] <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.bn2] <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.bn2] <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.bn3] <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.bn3] <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.bn4] <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.bn3] <exec_ddl_sql.succ>  (:)
2021-12-23 10:42:05,581 [INFO ][complexQueryExecutor2] [DDL_2.bn1] <exec_ddl_sql.succ>  (:)
2021-12-23 10:42:05,583 [INFO ][complexQueryExecutor2] [DDL_2.bn4] <exec_ddl_sql.succ>  (:)
2021-12-23 10:42:05,604 [INFO ][complexQueryExecutor2] [DDL_2.bn2] <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 10:42:05,618 [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

3.22.01.0dbe

2.32.1

2.32.1.1

user.xml analysisUserdbGroup dbGroup db.xml user.xml user.xml

```
<dbe:user xmlns:dbe="http://dbe.cloud/" version="4.0">
  <managerUser name="man1" password="654321" maxCon="100"/>
  <shardingUser name="root" password="123456" schema="testdb" readOnly="false" maxCon="20"/>
  <rwsSplitUser name="rwsu1" password="123456" dbGroup="rwGroup" maxCon="20"/>
  <analysisUser name="analysisUser" password="123456" dbGroup="dbGroup3" blacklist="blacklist1" maxCon="20"/>
</dbe:user>
```

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

2. analysisUserdbGroup

3. dbGroup instance dbGroup instance

2.32.2

dbledbInstancerwSplitMode0db.xml

1. dbInstance

2.

2.3.2.1 dbInstance

dbInstances

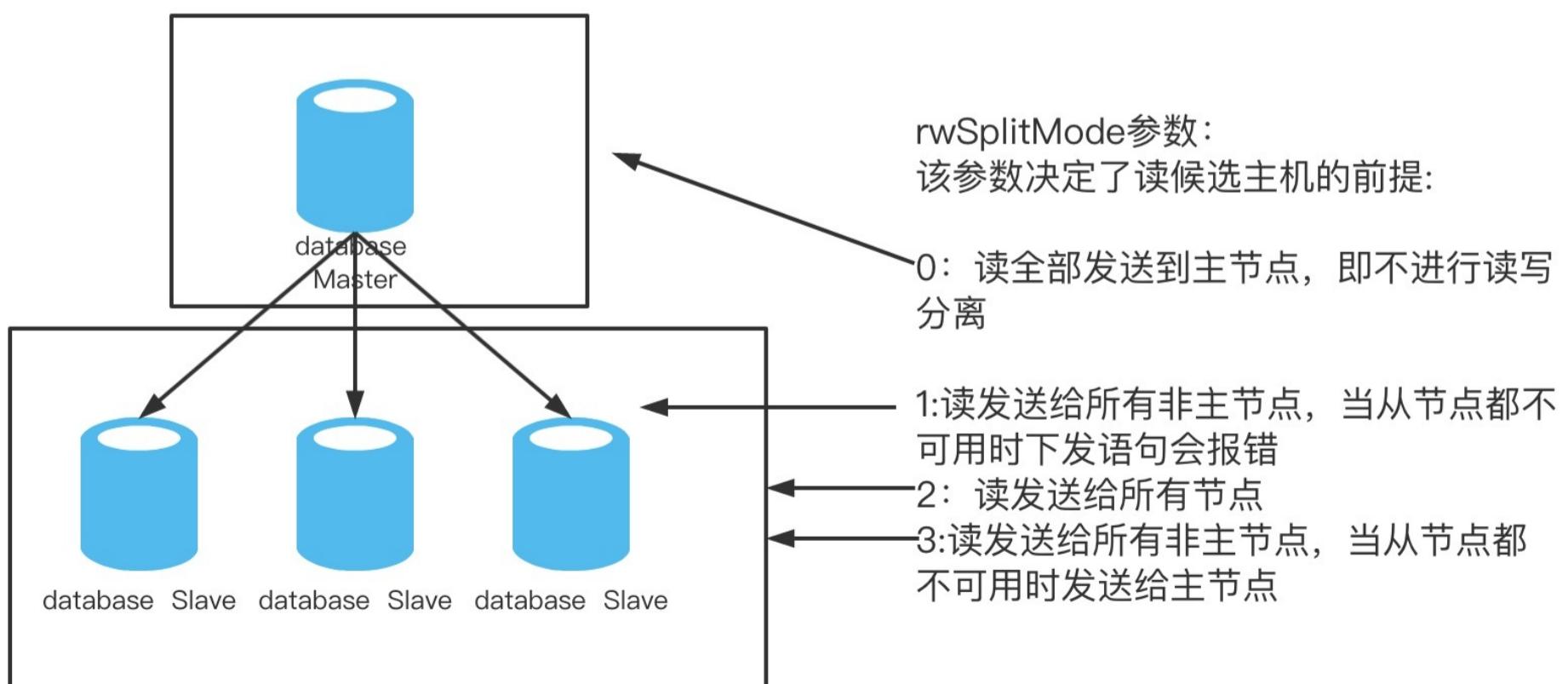
- (primary="true")
 - rwSplitMod2dbInstances
- (primary primary="false")
 - dbInstances
 - dbInstances
-
-

2.32.2.2

dbInstancedbInstance

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

2.32.2.3 dbGroup rwSplitMode



2.32.3

clickhousemysqlselectdble

2.32.4

1. clickhouse
2. selectdble
- 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

dbledble 3.22.01.0dblehint

hint dble hint

```
/*!dbe:plan=a & ( b | c )$left2inner$right2inner$in2join*/ 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

1. hint
2. Hibernate
3. sql join key hint

```
select * from table_a a, table_b b
```

-
- 4. sql right join hint
 - 5. sql hint
 - 6. 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

3.

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 - [3.1.1 DDL&Table Syntax](#)
 - [3.1.2 DDL&View Syntax](#)
 - [3.1.3 DDL&Index Syntax](#)
 - [3.1.4 DDL](#)
 - [3.1.5 DDL&Database Syntax](#)
 - [3.1.6 ONLINE DDL](#)
- [3.2 DML](#)
 - [3.2.1 INSERT](#)
 - [3.2.2 REPLACE](#)
 - [3.2.3 DELETE](#)
 - [3.2.4 UPDATE](#)
 - [3.2.5 SELECT](#)
 - [3.2.6 SELECT JOIN syntax](#)
 - [3.2.7 SELECT UNION Syntax](#)
 - [3.2.8 SELECT Subquery Syntax](#)
 - [3.2.9 LOAD DATA](#)
 - [3.2.10](#)
- [3.3 Prepared SQL Syntax](#)
- [3.4 Transactional and Locking Statements](#)
 - [3.4.1 Lock&unlock](#)
 - [3.4.2 XA](#)
 - [3.4.3](#)
 - [3.4.4 SET TRANSACTION Syntax](#)
- [3.5 DAL](#)
 - [3.5.1 SET](#)
 - [3.5.2 SHOW](#)
 - [3.5.3 KILL](#)
- [3.6](#)
- [3.7 Utility Statements](#)
- [3.8 Hint](#)
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- [3.10 \(alpha\)](#)
- [3.11](#)
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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'1'1dbeissue

<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

DDLdbлемysqlDDL(eg. ALTER EVENT)
dbлемysqlDDL

```
/*!dbe:sql=select ... from tbx where id=M*/ ddl statement
```

tbx idM

```
MySQL [TESTDB]> /*!dbe: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. SQLdbledbledbledbnullsqlmysqlonlineDDL

3.1.6.2 ONLINE DDL

MySQL 8.0online ddldbbleonline ddl

- Index Operations
- Primary Key Operations
- Column Operations
- Generated Column Operations
- Foreign Key Operations
- Table Operations
- Tablespace Operations
- Partitioning Operations

1			CREATE INDEX <i>name</i> ON <i>table</i> (<i>col_list</i>);ALTER TABLE <i>tbl_name</i> ADD INDEX <i>name</i> (<i>col_list</i>);		
2			DROP INDEX <i>name</i> ON <i>table</i> ;ALTER TABLE <i>tbl_name</i> DROP INDEX <i>name</i> ;		
3			ALTER TABLE <i>tbl_name</i> RENAME INDEX <i>old_index_name</i> TO <i>new_index_name</i> , ALGORITHM=INPLACE, LOCK=NONE;		mysql 5.6 online ddl
4		FULLTEXT	CREATE FULLTEXT INDEX <i>name</i> ON <i>table(column)</i> ;		mysql
5		Spatial	CREATE TABLE geom (g GEOMETRY NOT NULL); ALTER TABLE geom ADD SPATIAL INDEX(g), ALGORITHM=INPLACE, LOCK=SHARED;		mysql
6			ALTER TABLE <i>tbl_name</i> DROP INDEX i1, ADD INDEX i1(<i>key_part</i> ,...) USING BTREE, ALGORITHM=INSTANT;		
7			ALTER TABLE <i>tbl_name</i> ADD PRIMARY KEY (<i>column</i>), ALGORITHM=INPLACE, LOCK=NONE;		
8			ALTER TABLE <i>tbl_name</i> DROP PRIMARY KEY, ALGORITHM=COPY;		COPYdml
9			ALTER TABLE <i>tbl_name</i> DROP PRIMARY KEY, ADD PRIMARY KEY (<i>column</i>), ALGORITHM=INPLACE, LOCK=NONE;		
10			ALTER TABLE <i>tbl_name</i> ADD COLUMN <i>column_name</i> <i>column_definition</i> , ALGORITHM=INSTANT;		dble
11			ALTER TABLE <i>tbl_name</i> DROP COLUMN <i>column_name</i> , ALGORITHM=INPLACE, LOCK=NONE;		dble
12			ALTER TABLE <i>tbl</i> CHANGE <i>old_col_name</i> <i>new_col_name data_type</i> , ALGORITHM=INPLACE, LOCK=NONE;		dble
13			ALTER TABLE <i>tbl_name</i> MODIFY COLUMN <i>col_name column_definition</i> FIRST, ALGORITHM=INPLACE, LOCK=NONE;		
14			ALTER TABLE <i>tbl_name</i> CHANGE c1 c1 BIGINT,		dml

			ALGORITHM=COPY;		
15		VARCHAR	ALTER TABLE <i>tbl_name</i> CHANGE COLUMN c1 <i>c1</i> VARCHAR(255), ALGORITHM=INPLACE, LOCK=NONE;		dble
16			ALTER TABLE <i>tbl_name</i> ALTER COLUMN <i>col</i> SET DEFAULT <i>literal</i> , ALGORITHM=INSTANT;		
17			ALTER TABLE <i>tbl</i> ALTER COLUMN <i>col</i> DROP DEFAULT, ALGORITHM=INSTANT;		
18			ALTER TABLE <i>table</i> AUTO_INCREMENT= <i>next_value</i> , ALGORITHM=INPLACE, LOCK=NONE;		
19		NULL	ALTER TABLE <i>tbl_name</i> MODIFY COLUMN <i>column_name</i> <i>data_type</i> NULL, ALGORITHM=INPLACE, LOCK=NONE;		dble
20		NULL	ALTER TABLE <i>tbl_name</i> MODIFY COLUMN <i>column_name</i> <i>data_type</i> NOT NULL, ALGORITHM=INPLACE, LOCK=NONE;		dble
21		ENUM SET	CREATE TABLE t1 (c1 ENUM('a', 'b', 'c')); ALTER TABLE t1 MODIFY COLUMN c1 ENUM('a', 'b', 'c', 'd'), ALGORITHM=INSTANT;		
22			ALTER TABLE <i>tbl1</i> ADD CONSTRAINT <i>fk_name</i> FOREIGN KEY <i>index</i> (<i>col1</i>) REFERENCES <i>tbl2</i> (<i>col2</i>) <i>referential_actions</i> ;		dble
23			ALTER TABLE <i>tbl</i> DROP FOREIGN KEY <i>fk_name</i> ;		
24	Generated	Generated	ALTER TABLE t1 ADD COLUMN (c2 INT GENERATED ALWAYS AS (c1 + 1) STORED), ALGORITHM=COPY;		
25		Generated	ALTER TABLE t1 MODIFY COLUMN c2 INT GENERATED ALWAYS AS (c1 + 1) STORED FIRST, ALGORITHM=COPY;		
26		Generated	ALTER TABLE t1 DROP COLUMN c2, ALGORITHM=INPLACE, LOCK=NONE;		
27		VIRTUAL	ALTER TABLE t1 ADD COLUMN (c2 INT GENERATED ALWAYS AS (c1 + 1) VIRTUAL), ALGORITHM=INSTANT;		
28		VIRTUAL	ALTER TABLE t1 MODIFY COLUMN c2 INT GENERATED ALWAYS AS (c1 + 1) VIRTUAL FIRST, ALGORITHM=COPY;		
29		VIRTUAL	ALTER TABLE t1 DROP COLUMN c2, ALGORITHM=INSTANT;		
30					MySQL
31					dble

3.1.6.3

1. dble druidonline ddl “ALGORITHM=INPLACE, LOCK=NONE” <https://github.com/alibaba/druid/issues/3750>

3.2 DML

DML

- [3.2.1 INSERT](#)
- [3.2.2 REPLACE](#)
- [3.2.3 DELETE](#)
- [3.2.4 UPDATE](#)
- [3.2.5 SELECT](#)
- [3.2.6 SELECT JOIN syntax](#)
- [3.2.7 SELECT UNION Syntax](#)
- [3.2.8 SELECT Subquery Syntax](#)
- [3.2.9 LOAD DATA](#)
- [3.2.10](#)

3.2.1 INSERT

3.2.1.1 Syntax

```

INSERT [INTO] tbl_name
[(col_name,...)]
{VALUES | VALUE} ({expr },...),(...),...
[ ON DUPLICATE KEY UPDATE
  col_name=expr
  [, col_name=expr] ... ]
OR
INSERT [INTO] tbl_name
SET col_name={expr | DEFAULT}, ...
[ ON DUPLICATE KEY UPDATE
  col_name=expr [, col_name=expr] ... ]

```

3.2.1.2

```

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));

```

3.2.1.3

- ERROW
- dble
- CREATE TABLE `test` (`id` enum('1','2','3') DEFAULT '1')id'1'dbleissue <https://github.com/actiontech/dble/issues/816>
- insert/replace... select dbleSQL
 -
 -
 - select

3.2.2 REPLACE

3.2.2.1 Syntax

REPLACE

[INTO] tbl_name [(col_name [, col_name] ...)]

{VALUES | VALUE} (value_list) [, (value_list)] ...

OR

REPLACE

[INTO] tbl_name SET assignment_list

3.2.2.2

```
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';
```

3.2.2.3

- replace
- replaceIDIDID
- insert/replacedbleSQL
 -
 -
 - select

3.2.3 DELETE

3.2.3.1 Syntax

DELETE [IGNORE]

FROM tbl_name [WHERE where_condition]

3.2.3.2

```
delete from test where id>5;
```

3.2.3.3

- Delete where condition
- Join DELETE
- DELETEDELETE
 - update/delete where where
 - update/delete where where

3.2.4 UPDATE

3.2.4.1 Syntax

```
UPDATE table_reference  
SET col_name1={expr1} [, col_name2={expr2}] ...  
[WHERE where_condition]
```

3.2.4.2

```
UPDATE test SET VALUE =1 where id=5;
```

3.2.4.3

- UPDATEwhere_condition
- Join UPDATE
- updateDELETE
 - update/deletewhere where
 - update/deletewherewhere

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 | position} [ASC | DESC], ...]  
[HAVING where_condition] [ORDER BY {col_name | expr | position} [ASC | DESC], ...]  
[LIMIT {[offset,] row_count | row_count OFFSET offset}]  
[FOR {UPDATE [NOWAIT | SKIP LOCKED] | SHARE}  
| LOCK IN SHARE MODE]
```

3.2.5.2

```
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:

table_references:

```
table_reference [, table_reference] ...
```

table_reference:

```
table_factor | join_table
```

table_factor:

```
tbl_name [[AS] alias]
| table_subquery [AS] alias
| ( table_references )
```

join_table:

```
table_reference [INNER | CROSS] JOIN table_factor [join_condition]
| table_reference STRAIGHT_JOIN table_factor
| table_reference STRAIGHT_JOIN table_factor ON conditional_expr
| table_reference {LEFT|RIGHT} [OUTER] JOIN table_reference join_condition
| table_reference NATURAL [{LEFT|RIGHT} [OUTER]] JOIN table_factor
```

join_condition:

```
ON conditional_expr
| USING (column_list)
```

3.2.7 UNION Syntax:

```
SELECT ...  
UNION [ALL | DISTINCT] SELECT ...  
[UNION [ALL | DISTINCT] SELECT ...]
```

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

The most common use of a subquery is in the form:

```
non_subquery_operand comparison_operator (subquery)
```

Where comparison_operator is one of these operators:

```
= > < >= <= <> != <=>
```

MySQL also permits this construct:

```
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)
```

Where comparison_operator is one of these operators:

```
= > < >= <= <> !=
```

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);
```

Not support Correlated Subqueries for now.

3.2.8.6 Derived Tables (Subqueries in the FROM Clause)

```
SELECT ... FROM (subquery) [AS] tbl_name ...
```

3.2.9 LOAD DATA

3.2.9.1 Syntax

LOAD DATA

[LOCAL]

INFILE 'file_name' 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']]

3.2.9.2

```
load data infile 'data.txt' into table test_table CHARACTER SET 'utf8' FIELDS TERMINATED by ',';
```

3.2.9.3

dbleMySQL,maxRowSizeToFile(bootstrap.cnf) load data local infile

`local_infile`load data.

#1085

3.2.9.4

- BUGdbleCHARACTER SET charset_name
- mysqldbleload 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

DO Syntax

HANDLER Syntax

LOAD XML Syntax

3.3 PREPARE SQL Syntax

3.3.1 PREPARE Syntax

```
PREPARE stmt_name FROM preparable_stmt
```

```
prepare stmt1 from "select * from a_test where id=?";
```

3.3.2 EXECUTE Syntax

```
EXECUTE stmt_name  
[USING @var_name [, @var_name] ...]
```

```
SET @a = 1;  
EXECUTE stmt1 USING @a;
```

3.3.3 DEALLOCATE PREPARE Syntax

```
{DEALLOCATE | DROP} PREPARE stmt_name
```

```
DROP PREPARE stmt1;
```

3.4 Transactional and Locking Statements

Transactional and Locking Statements

- [3.4.1 Lock&unlock](#)
- [3.4.2 XA](#)
- [3.4.3](#)
- [3.4.4 SET TRANSACTION Syntax](#)

3.4.1 Lock&unlock

3.4.1.1 Syntax

LOCK TABLES tbl_name [[AS] alias] **lock_type**

lock_type: READ | WRITE

UNLOCK TABLES

3.4.1.2

```
lock tables test_table read;  
unlock tables;
```

3.4.1.3

1. session
- 2.

3.4.2 XA

3.4.2.1 Syntax

XA

set xa = {0|1}

START TRANSACTION;

BEGIN

SET autocommit = {0 | 1}

COMMIT

ROLLBACK

3.4.2.2

- xasql

3.4.3

3.4.3.1 Syntax

START TRANSACTION;

BEGIN

SET autocommit = {0 | 1}

COMMIT

ROLLBACK

3.4.3.2

- 2PC(xa)commit,XA

3.4.4 SET TRANSACTION 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

session

3.4.5 SAVEPOINT, ROLLBACK TO SAVEPOINT, and RELEASE SAVEPOINT Syntax

3.4.5.1 Syntax

SAVEPOINT *identifier*

ROLLBACK [WORK] TO [SAVEPOINT] *identifier*

RELEASE SAVEPOINT *identifier*

3.4.5.1

```
# 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
```

3.4.5.2

1. mysql,savepoint,savepoint.dblesavepoint,.
2. ROLLBACK TO [SAVEPOINT] *identifier* work .

3.5 DAL

DAL

- [3.5.1 SET](#)
- [3.5.2 SHOW](#)
- [3.5.3 KILL](#)

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_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  
updateable_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
dbleview
- 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

3.5.3.1 KILL 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

3.6

3.6.1 Syntax

Create procedure

```
/Hint/ CREATE [DEFINER = { user | CURRENT_USER }]
```

```
PROCEDURE sp_name ([proc_parameter[,...]])
```

```
[characteristic ...] routine_body
```

```
/Hint/ CREATE
```

```
[DEFINER = { user | CURRENT_USER }]
```

```
FUNCTION sp_name ([func_parameter[,...]])
```

```
RETURNS type [characteristic ...] routine_body
```

drop procedure

```
/Hint/ DROP {PROCEDURE | FUNCTION} [IF EXISTS] sp_name
```

call procedure

```
[/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

```
USE db_name
```

```
use TESTDB;
```

3.7.2 EXPLAIN

```
EXPLAIN explainable_stmt  
SELECT statement  
| DELETE statement  
| INSERT statement  
| REPLACE statement  
| UPDATE statement
```

1. INSERT

```
explain SELECT select * from a_test where id=1;
```

2. dbleEXPLAIN DESC

3.7.3 EXPLAIN2

```
EXPLAIN2 shardingNode=node_name sql$sql_stmt
```

```
explain2 shardingNode=dn2 sql=select * from a_test where id=1;
```

3.7.4 DESC

```
{DESCRIBE | DESC} tbl_name [col_name | wild]
```

```
DESC a_test id;
```

```
:dbleEXPLAIN DESC
```

3.8 Hint

3.8.1 -Syntax

```
/* { ! | #}dbe: {sql=SELECT select_expr FROM table_references WHERE where_condition
|shardingNode=shardingNode_name
|db_type={slave|master}}
*/
ordinary_sql
```

3.8.2 -Syntax

```
/* { ! | #}dbe: {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

```
/*!dbe:sql=select 1 from sbtest */ call p_show_time();
/*!dbe:shardingNode=dn1*/ update sbtest set name = 'test';
/*!dbe:db_type=master*/ select count(*) from sbtest;
/*!dbe:db_instance_url=127.0.0.1:3307*/ select count(*) from sbtest;
/*#dbe:sql=select 1 from sbtest */ call p_show_time();
/*#dbe:shardingNode=dn1*/ update sbtest set name = 'test';
/*#dbe:db_type=master*/ select count(*) from sbtest;
/*#dbe: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
 - createtableoptionDATA DIRECTORYALGORITHMtable optionalter table
 - ALTER TABLE ... LOCK ...
 - ALTER TABLE ... ORDER BY ...
 - create table ... select ...
 -
 -
 -
 -
 -
- DML

```

<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... VALUES(expr)expr
- INSERT... SELECT...
 - 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(), ATANO	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	Y
%, 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
 AVG\SUM dble MySQL
 MySQL MySQL,
 for data type float, dble and mysql may get different results

3.10.9 Full-Text Search Functions

not supported

3.10.10 XML Functions

not supported

3.10.11 Encryption and Compression Functions

not supported

3.10.12 Information Functions

not supported

3.10.13 Spatial Analysis Functions

not supported

3.10.14 JSON 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. mysqlsourceload 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

3.12 Implicit commit SQL

3.12.1

1064,1046.

3.12.2 sharding

- [3.1.1 DDL&Table Syntax](#)
- [3.1.2 DDL&View Syntax](#)
- [3.1.3 DDL&Index Syntax](#)
- Lock tables...

3.12.3 rwsplitmysql:

- 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

jdbcdbCLIENT_FOUND_ROWS

dbleIGNORE_SPACE select @@sql_mode IGNORE_SPACE

[MySQL issue-972](#)

IGNORE_SPACEsessionsql_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_LENENC_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_OPTION S	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

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

- jdbcuseServerPrepStmts 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 preparedStatement instanceof ServerPreparedStatement;
```

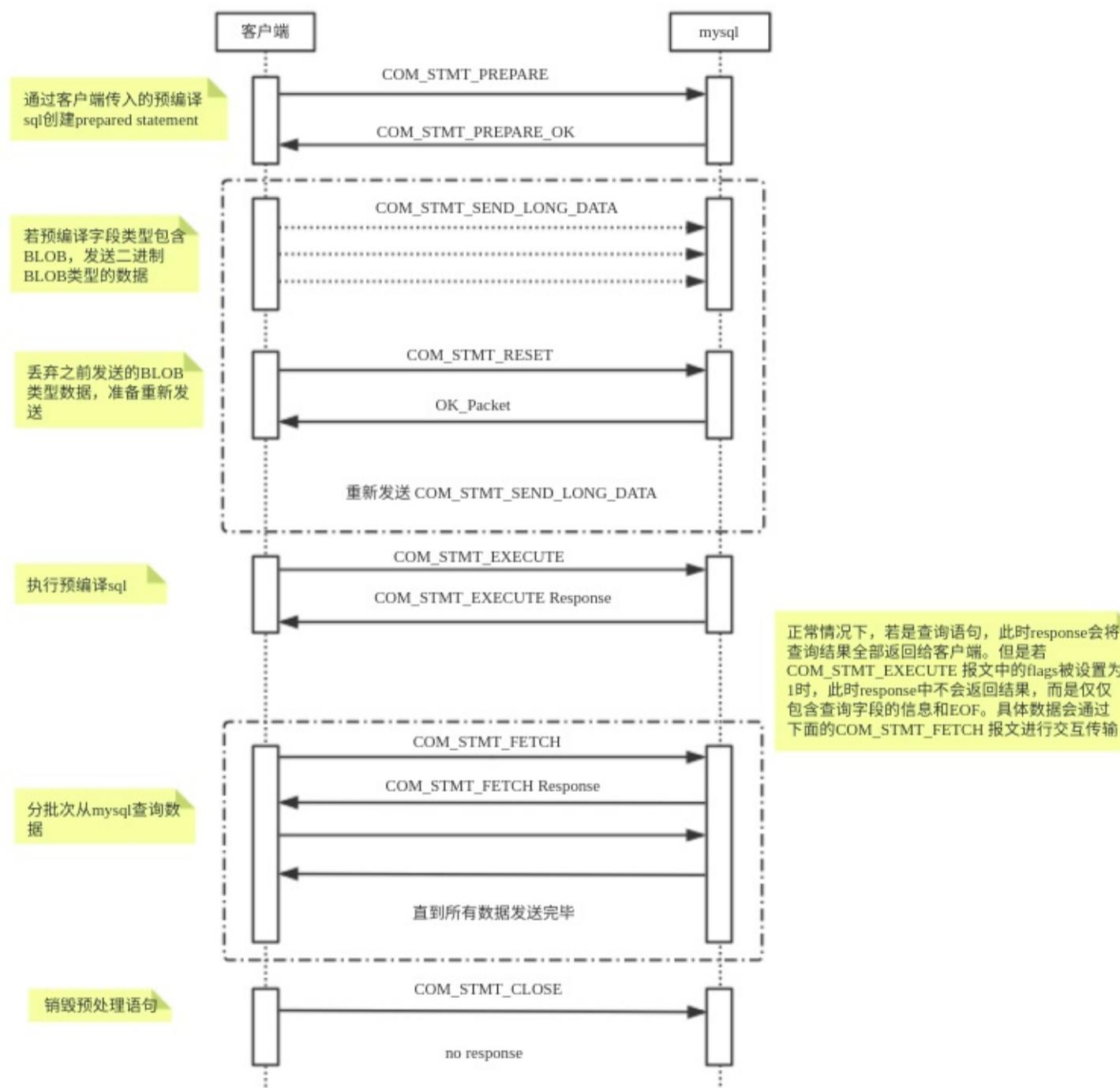
4.4.2

mysql

4.4.4

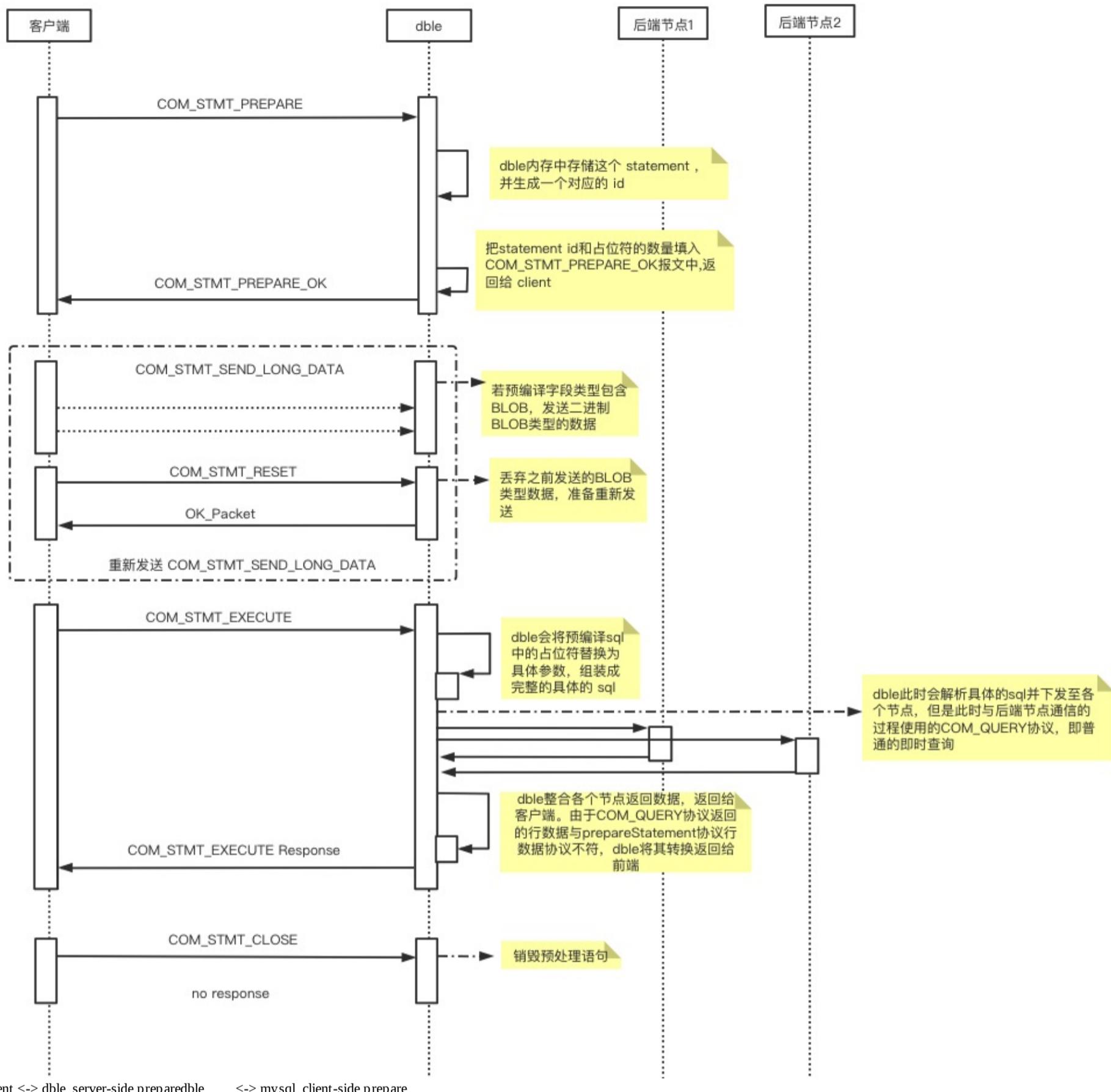
- server-side prepare client PS server server
- client-side prepare : client PS prepare SQL server server ”“

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 cursor server client
- client-side cursor: client tcp socket(server client)
- client-side cursor client cursor API client

4.4.8.2

DBLE

- <3.21.02,
- =3.21.02,
- >3.21.02, bootstrap.cnf-DenableCursor=false

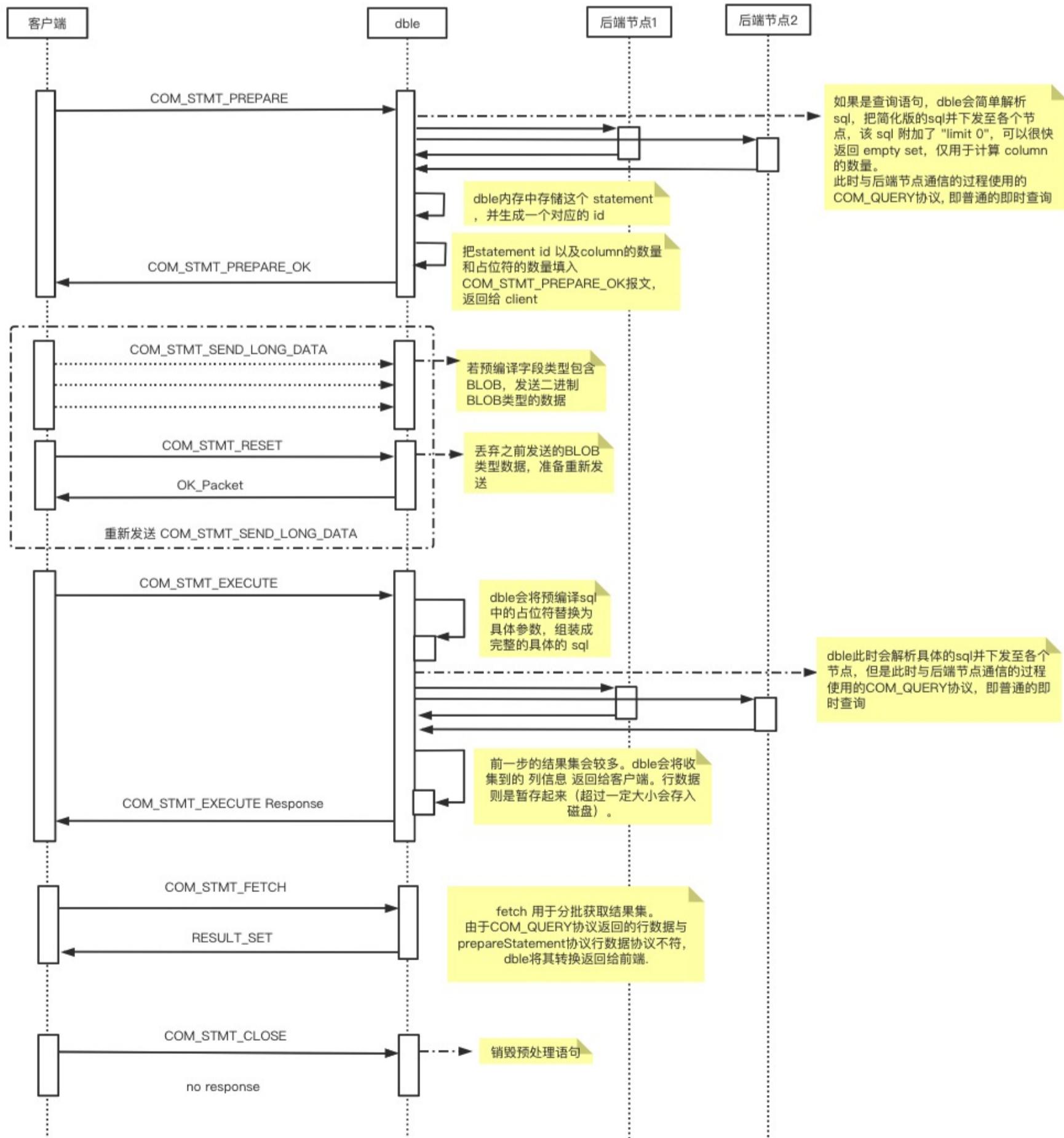
1. driver mysql jdbc driver
2. jdbc useServerPrepStmts useCursorFetch
3. prepareStatement fetchSize 0.
4. execute

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

4.5

- EOF_Packet
- ERR_Packet
- OK_Packet
- LOCAL_INFILE Packet
- PACKET_LOCAL_INFILE
- PACKET_RESULTSET

5.

- [5.1 druid](#)
- [5.2](#)

5.1 druid

1. INSERT ... VALUE ... INSERT ... VALUES ...VALUE[S]

druidbugVALUES[S]druid

druid[issue2218](#)

dbleissue [dble_issue_379](#).

2. SHOW ALL TABLES dble

3.

[dble_issue_788](#)

5.2

1. : .parentkey
issue : <https://github.com/actiontech/dble/issues/12>
2. JDBCrewriteBatchedStatements=true
:
insert : insertinsert.. values(),(),com_query dble
3. JDBCuseServerPrepStmts=true
: dbleBinary Protocol Text Protocol
4. lock/unlock
issue : <https://github.com/actiontech/dble/issues/38>
5. schema.xml3.20.07.0
: schema.xml
issue : <https://github.com/actiontech/dble/issues/70>
6. dbletabledble, dble
7. /
: sql
issue : <https://github.com/actiontech/dble/issues/85>
8. : dropjavatcp_keepalive
issue : <https://github.com/actiontech/dble/issues/87>
9. /
:
issue : <https://github.com/actiontech/dble/issues/100>
10. order by lock in share mode/for update , lock clause is ignored
:
issue : <https://github.com/actiontech/dble/issues/127>
11. _charset_name 'string' _charset_name+b'val'
issue : <https://github.com/actiontech/dble/issues/262>
issue : <https://github.com/actiontech/dble/issues/267>
12. set sql_select_limit
issue : <https://github.com/actiontech/dble/issues/331>
13. sEndDefault 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
2dble SCHEMATA

driver

0

```

1. SELECT TABLE_SCHEMA, TABLE_NAME, TABLE_TYPE
   FROM information_schema.TABLES WHERE TABLE_SCHEMA = 'testdb'
   ORDER BY TABLE_SCHEMA, TABLE_TYPE
2. SELECT TABLE_SCHEMA, TABLE_NAME, COLUMN_NAME, COLUMN_TYPE
   FROM information_schema.COLUMNS
  WHERE TABLE_SCHEMA = 'testdb'
  ORDER BY TABLE_SCHEMA, TABLE_NAME
3. SELECT DISTINCT ROUTINE_SCHEMA, ROUTINE_NAME, PARAMS.PARAMETER
   FROM information_schema.ROUTINES LEFT JOIN
   ( SELECT SPECIFIC_SCHEMA, SPECIFIC_NAME,
          GROUP_CONCAT(CONCAT(DATA_TYPE, ' ', PARAMETER_NAME) ORDER BY ORDINAL_POSITION SEPARATOR ', ') PARAMETER, ROUTINE_TYPE
     FROM information_schema.PARAMETERS GROUP BY SPECIFIC_SCHEMA, SPECIFIC_NAME, ROUTINE_TYPE
   )PARAMS
  ON ROUTINES.ROUTINE_SCHEMA = PARAMS.SPECIFIC_SCHEMA AND
  ROUTINES.ROUTINE_NAME = PARAMS.SPECIFIC_NAME AND
  ROUTINES.ROUTINE_TYPE = PARAMS.ROUTINE_TYPE
  WHERE ROUTINE_SCHEMA = 'testdb' ORDER BY ROUTINE_SCHEMA
4. SELECT TABLE_NAME, CHECK_OPTION, IS_UPDATABLE, SECURITY_TYPE, DEFINER
   FROM information_schema.VIEWS
  WHERE TABLE_SCHEMA = 'testdb' ORDER BY TABLE_NAME ASC
5. SELECT * FROM information_schema.ROUTINES
  WHERE ROUTINE_SCHEMA = 'testdb' ORDER BY ROUTINE_NAME
6. SELECT EVENT_CATALOG, EVENT_SCHEMA, EVENT_NAME, DEFINER, TIME_ZONE,
   EVENT_DEFINITION, EVENT_BODY, EVENT_TYPE, SQL_MODE, STATUS, EXECUTE_AT,
   INTERVAL_VALUE, INTERVAL_FIELD, STARTS, ENDS, ON_COMPLETION, CREATED,
   LAST_ALTERED, LAST_EXECUTED, ORIGINATOR, CHARACTER_SET_CLIENT,
   COLLATION_CONNECTION, DATABASE_COLLATION, EVENT_COMMENT
  FROM information_schema.EVENTS WHERE EVENT_SCHEMA = 'testdb'
  ORDER BY EVENT_NAME ASC
7. SELECT COUNT(*) FROM information_schema.TABLES
  WHERE TABLE_SCHEMA = 'testdb' UNION
SELECT COUNT(*)
  FROM information_schema.COLUMNS
  WHERE TABLE_SCHEMA = 'testdb' UNION
SELECT COUNT(*) FROM information_schema.ROUTINES WHERE ROUTINE_SCHEMA = 'testdb'
```

7

- [7.1 SQL](#)
- [7.2 dbleDemo](#)
- [7.3](#)

7.1 SQL

- SQLSQLSQL

1

```
dbledbleSQLSQL SQLdbeSQLSQLSQL dbleMySQL dbleEXPLAINdbe
```

```
explain select id,accountno from account where userid=2;
```

EXPLAINSQL EXPLAIN2

```
explain2 shardingNode=dn1 sql=select id,accountno from account where userid=2;
```

explain2sqlexplainshardingNodeexplain

2SQL

SQL:

- SQL
-
- INININ
- SQLDISTINCTGROUP BYORDER BYSQL
-

3

- Join
-
-
-
- JoinJoinJoin
- Join
- JoinJoin
- limit a,b
- GROUP
-
- Join

7.2 dbleDemo

ibatis

ibatisdbleMySQL JDBC

```
jdbc.driverClass=com.mysql.jdbc.Driver
jdbc.jdbcUrl=jdbc:mysql://127.0.0.1:8066/TESTDB?useUnicode=true&characterEncoding=utf-8
jdbc.user=root
jdbc.password=123456
```

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE mapper
PUBLIC "-//mybatis.org//DTD Mapper 3.0//EN"
"http://mybatis.org/dtd/mybatis-3-mapper.dtd">
<mapper namespace="com.mapper.UserMapper">
<insert id="saveUser" parameterType="com.bean.User">
    insert into user(id,name,phone,birthday)
    values (0,#{name},#{phone},#{birthday})
    <selectKey keyProperty="id" order="after" resultType="int">
        select last_insert_id() as id
    </selectKey>
</insert>
<delete id="deleteUserById" parameterType="java.lang.String">
    delete from user where id=#{id}
</delete>
<update id="updateUser" parameterType="com.bean.User">
    update user set name=#{name},phone=#{phone},birthday=#{birthday} where id=#{id}
</update>
<update id="updateUsers">
    /*!dble:sql=select * from user;*/update users set usercount=(select count(*) from user),ts=now()
</update>
<select id="getUserById" parameterType="java.lang.String" resultType="com.bean.User">
    select * from user where id=#{id}
</select>
<select id="getUsers" resultType="com.bean.User">
    select * from user
</select>
```

select last_insert_id() as idID updateUsers dbleibatis##

hibernate

hibernatedbleMySQL hibernate.cfg.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE hibernate-configuration PUBLIC
"-//Hibernate/Hibernate Configuration DTD 3.0//EN"
"http://www.hibernate.org/dtd/hibernate-configuration-3.0.dtd">
<hibernate-configuration>
<session-factory>
    <property name="hibernate.connection.driver_class">com.mysql.jdbc.Driver</property>
    <property name="hibernate.connection.url">jdbc:mysql://192.168.58.51:8066/testdb?useUnicode=true&characterEncoding=utf-8</property>
    <property name="hibernate.connection.username">root</property>
    <property name="hibernate.connection.password">123456</property>
    <property name="hibernate.dialect">org.hibernate.dialect.MySQLInnoDBDialect</property>
    <property name="hibernate.format_sql">true</property>
    <property name="hibernate.hbm2ddl.auto">update</property>
    <mapping resource="com/actiontech/test/News.hbm.xml"/>
</session-factory>
</hibernate-configuration>
```

News.hbm.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE hibernate-mapping PUBLIC
"-//Hibernate/Hibernate Mapping DTD 3.0//EN"
"http://www.hibernate.org/dtd/hibernate-mapping-3.0.dtd">
<hibernate-mapping>
    <class name="com.actiontech.test.News" table="news_table">
        <id name="id" type="java.lang.Integer">
            <column name="id" />
```

```
</id>
<property name="title" type="java.lang.String">
    <column name="title" />
</property>
<property name="content" type="java.lang.String">
    <column name="content" />
</property>
</class>
</hibernate-mapping>
```

News.java

```
package com.actiontech.test;
public class News {
    private Integer id;
    private String title;
    private String content;
    public Integer getId() {
        return id;
    }
    public void setId(Integer id) {
        this.id = id;
    }
    public String getTitle() {
        return title;
    }
    public void setTitle(String title) {
        this.title = title;
    }
}
```

public String getContent() { return content; } public void setContent(String content) { this.content = content; } </pre> 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+"\t"+i+"\t"+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="100">
        <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="100">
        <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="100">
 <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="100">
 <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

dble

```
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 sysbenchdble

- [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

## 9.2 dble

-DNIOFrontRW=10 -DNIOBackendRW=10 -DfrontWorker=8 -DbackendWorker=6 -DsqlExecuteTimeout=3000000

### 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
- 172.20.134.5:33066 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) VALUES (49823, 58210, '2711667985-11552069038-79242882109-05602914209-02374993639-32242662584-65155028223-08319627673-44873060047-22215118936', '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
- jointstudentclass
- 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="100">
<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="100">
<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.
  - o mysql> show databases;
  - o ERROR 1820 (HY000): You must reset your password using ALTER USER statement before executing this statement.
  - o 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: 1984;
```

- 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  
JavaJavacc++
2. JMX  
JM XJava Management ExtensionsJava  
JPAJMS
3. Jconsole  
JconsoleJDKJVM.java

## db-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

- numbertnameNULL
  - 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 + ... + C_nL_n

dble-hash

Count=2,Length=2 -> [0,2][2,4] -> =4
key 1,2,3,4,5,6,7,8

node1	node2
1,4,5,8	2,3,6,7

Count=3,Length=2 -> [0,2][2,4][4,6] -> =6 key 1,2,3,4,5,6,7,8

node1	node2	node3
1,6,7	2,3,8	4,5

count

summary

node

Consistent Hashing

NodeA NodeB NodeC NodeD ABCD A B C D AB CD

```
A ----> NodeA
B ----> NodeB
C ----> NodeC
D ----> NodeD
```

Node CABDC Node D Node X:

```
A ----> NodeA
B ----> NodeB
-----> NodeX
C ----> NodeC
D ----> NodeD
```

ABDC Node X

Hash node

“”

NodeA
Node 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](#)

