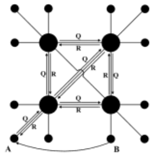
Leader-us系列



Mycat从入门到精通第2周

DATAGURU专业数据分析社区

Mycat术语与原理

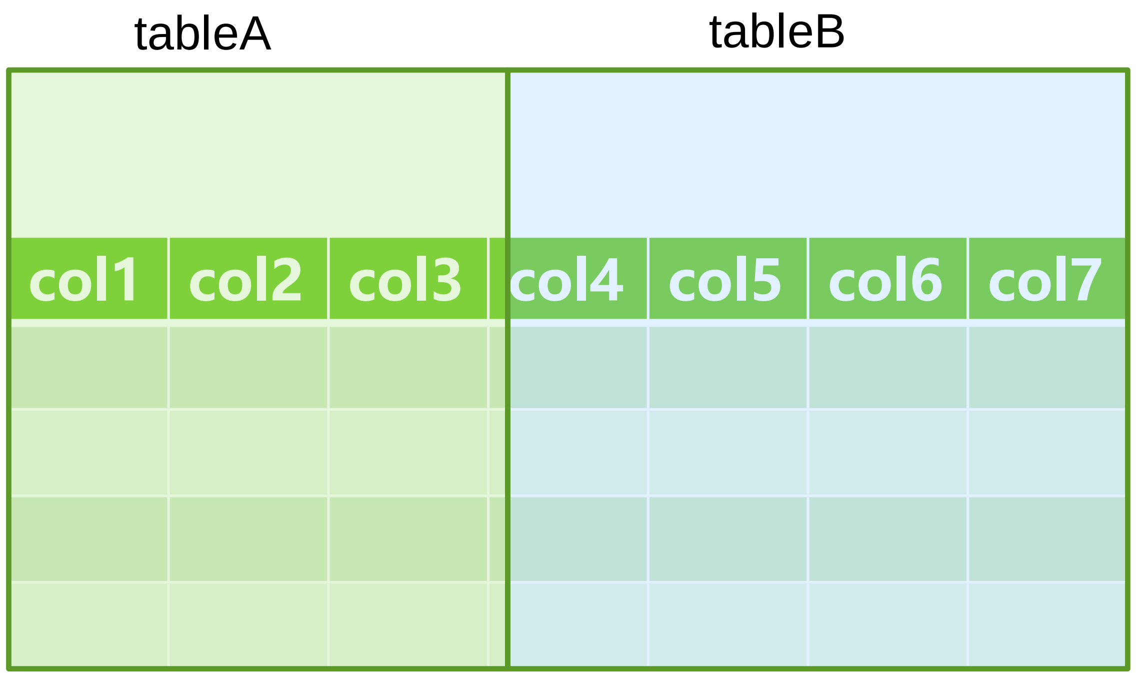
Mycat基本功能介绍

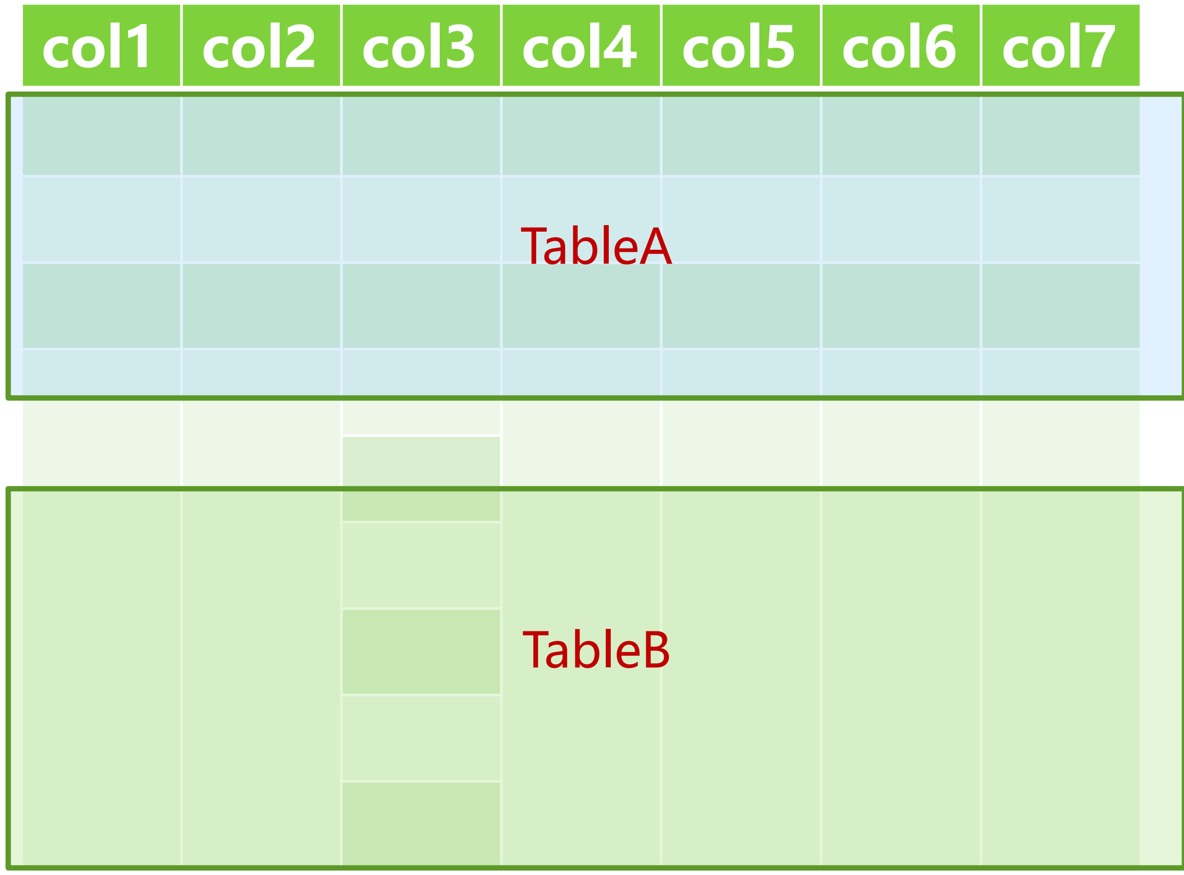
Mycat配置入门

Mycat术语与原理

分片

垂直分片 VS水平分片

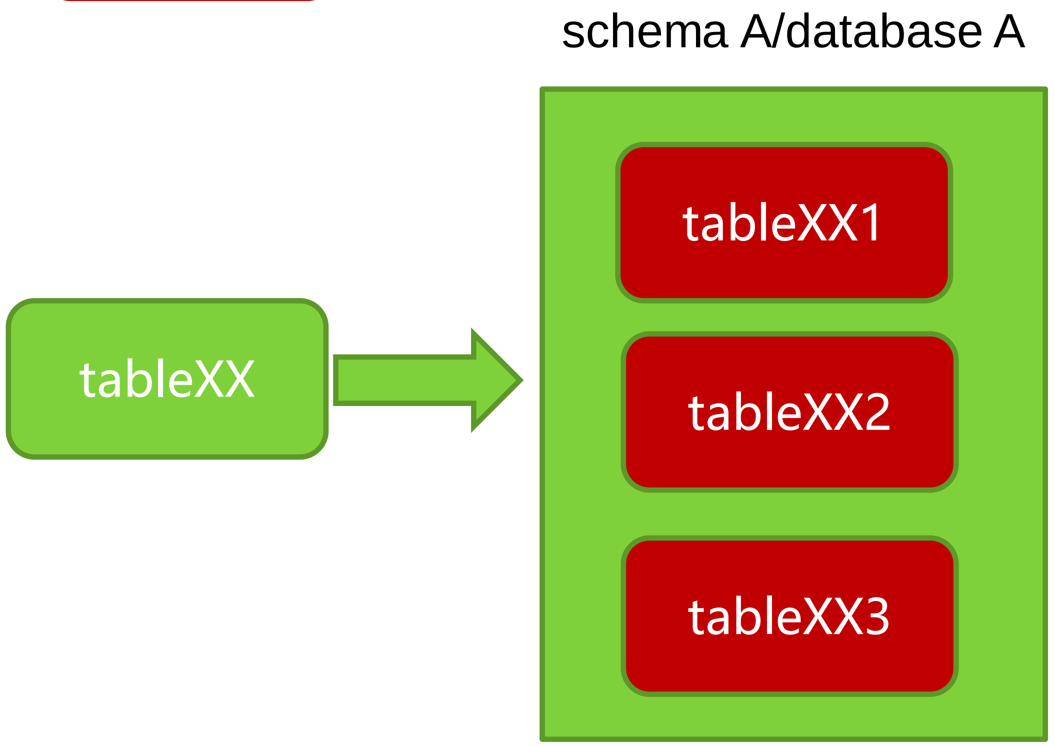


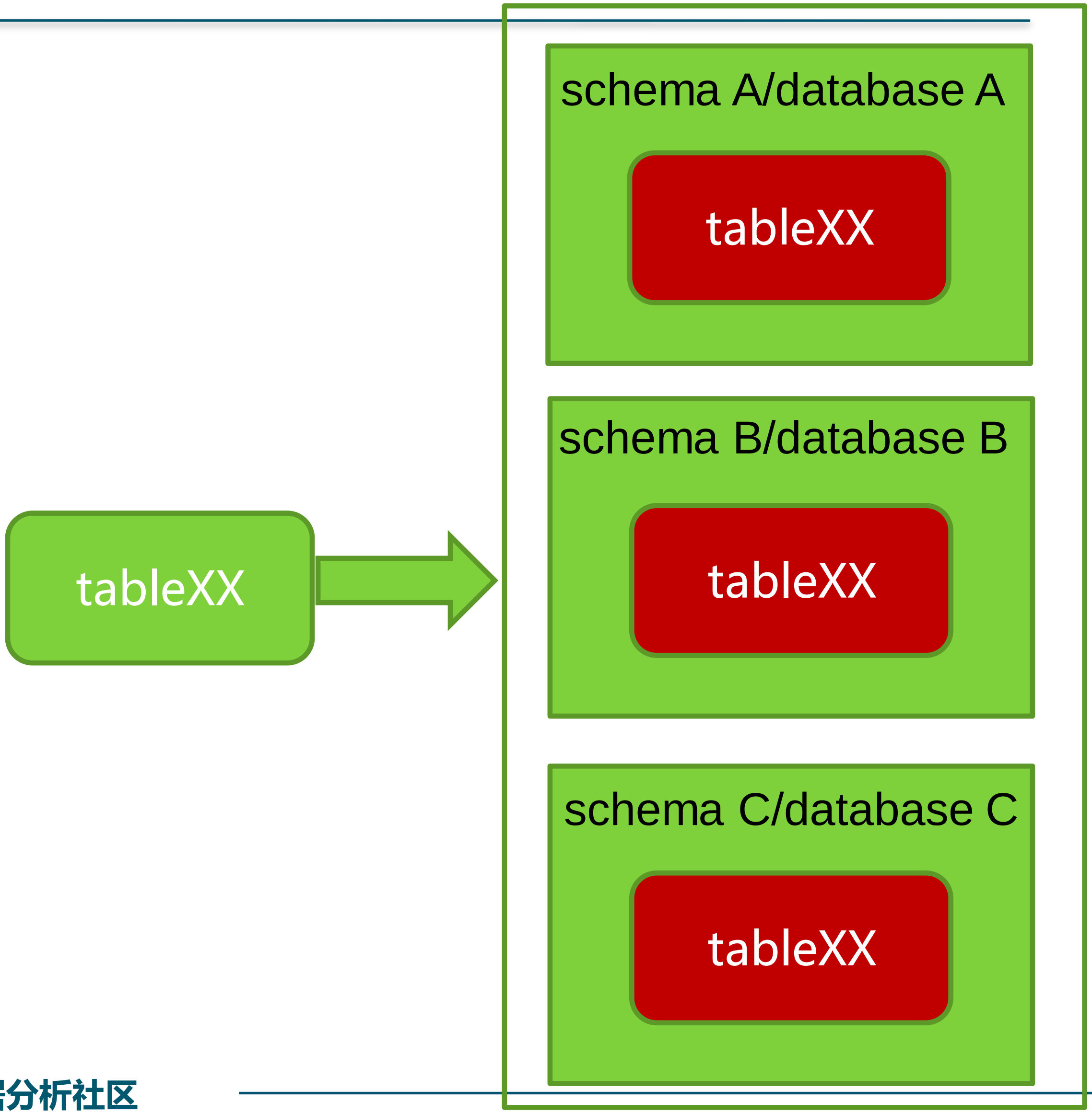


Mycat术语与原理

分片

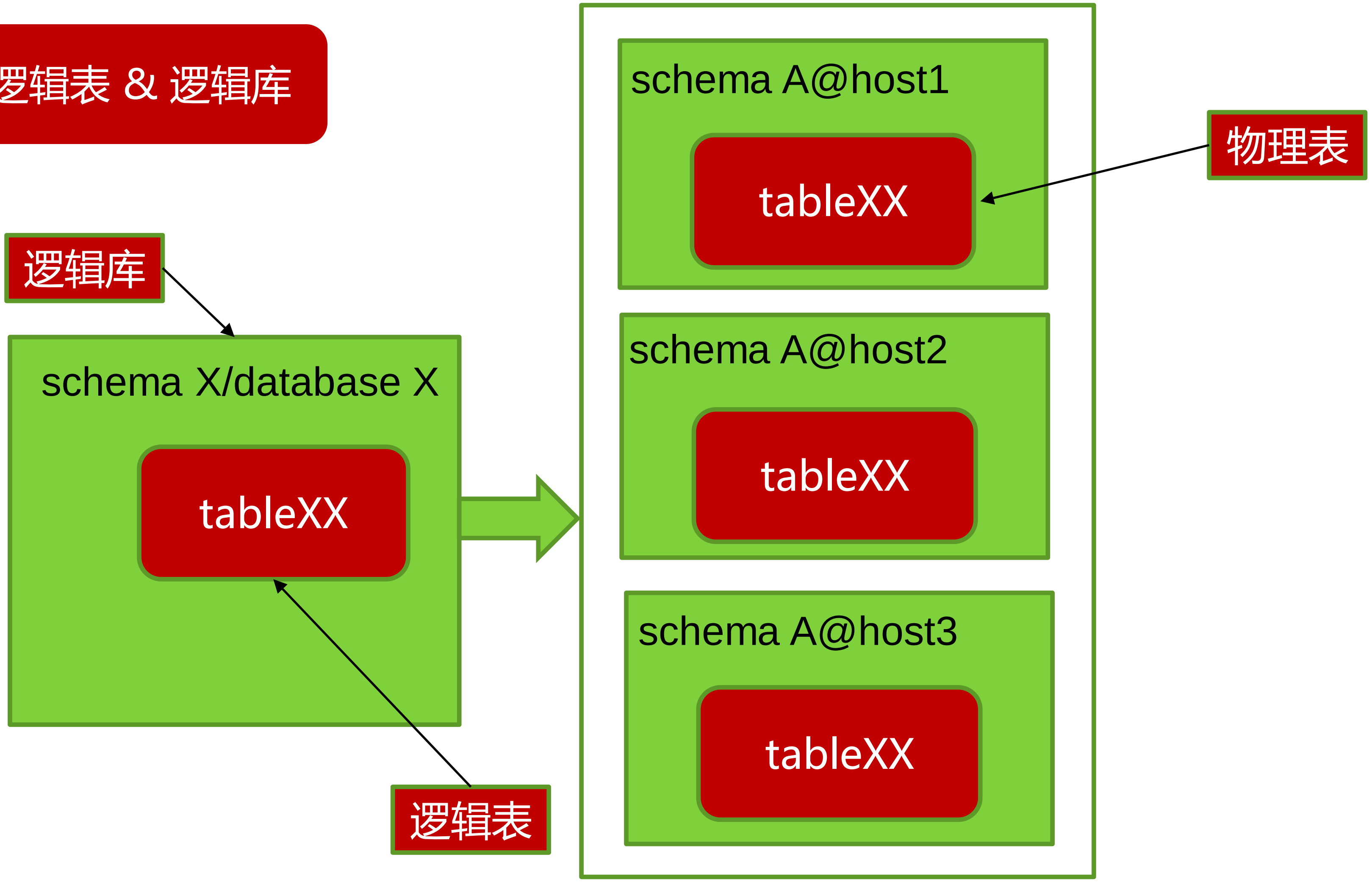
分表 VS分库



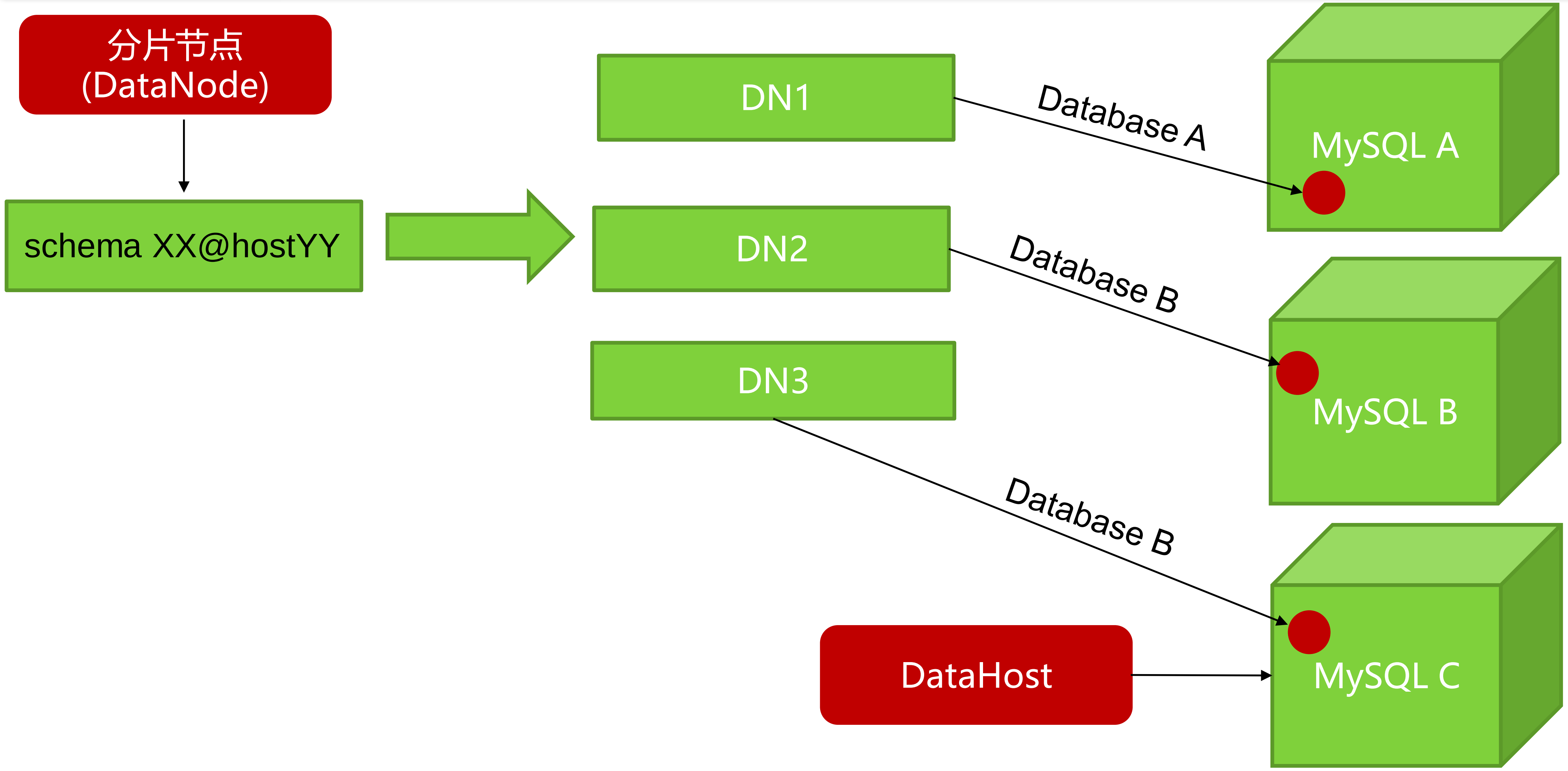


Mycat术语与原理

逻辑表 & 逻辑库



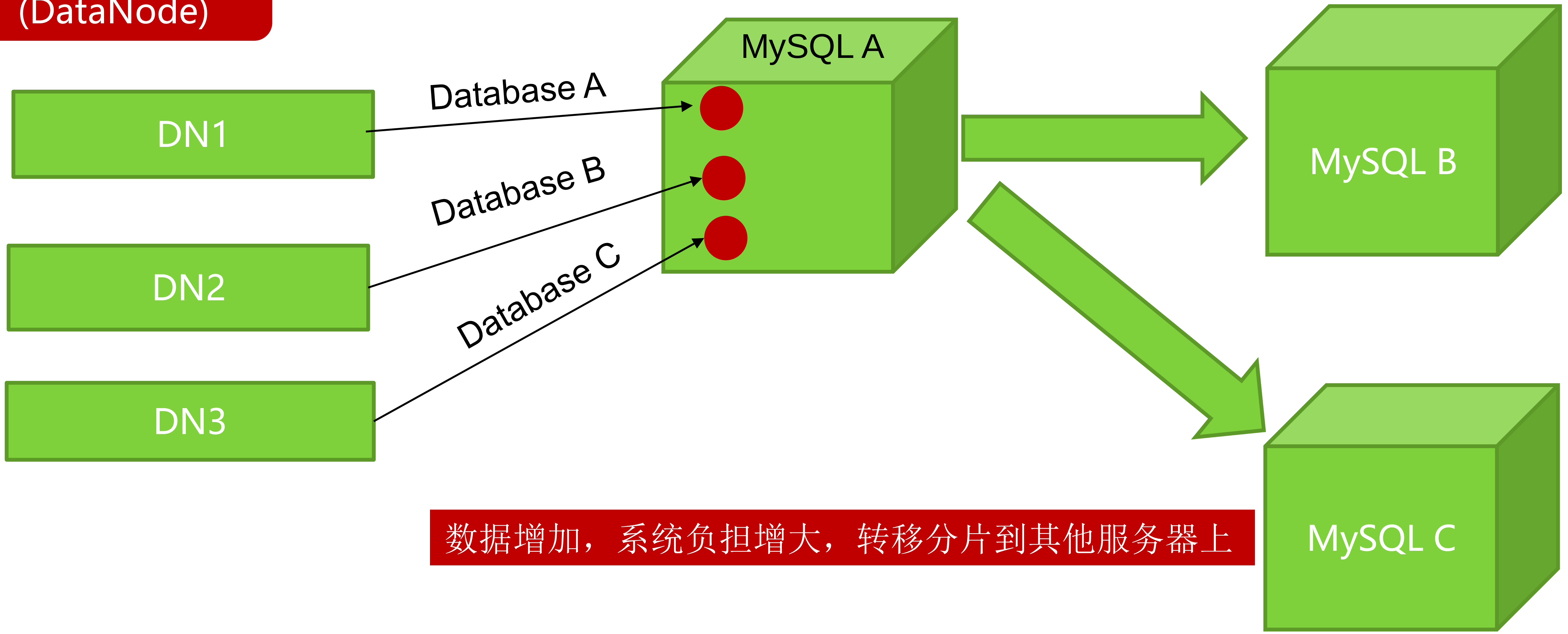
Mycat术语与原理



分片节点
(DataNode)
schema XX@hostYY
DN1
DN2
DN3
Database A
Database B
Database B
MySQL A
MySQL B
MySQL C
DataHost

Mycat术语与原理

分片节点
(DataNode)

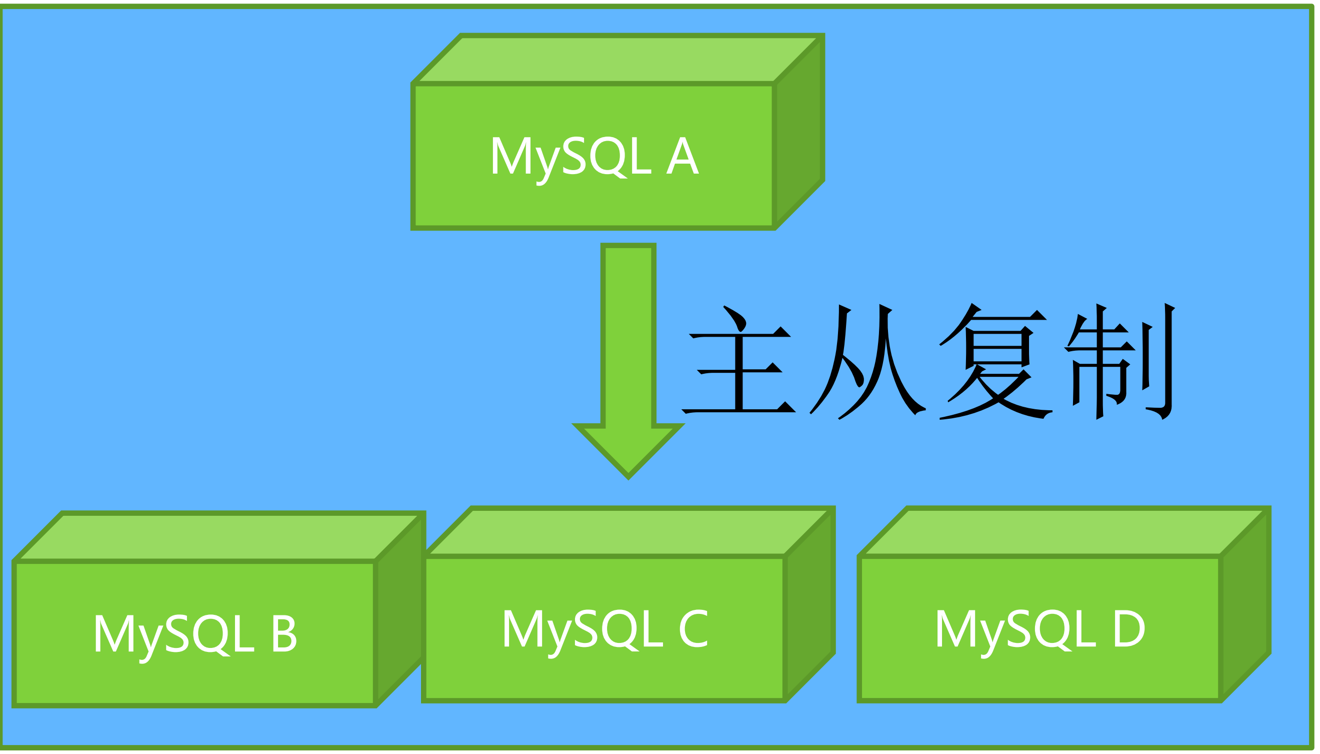


数据增加，系统负担增大，转移分片到其他服务器上

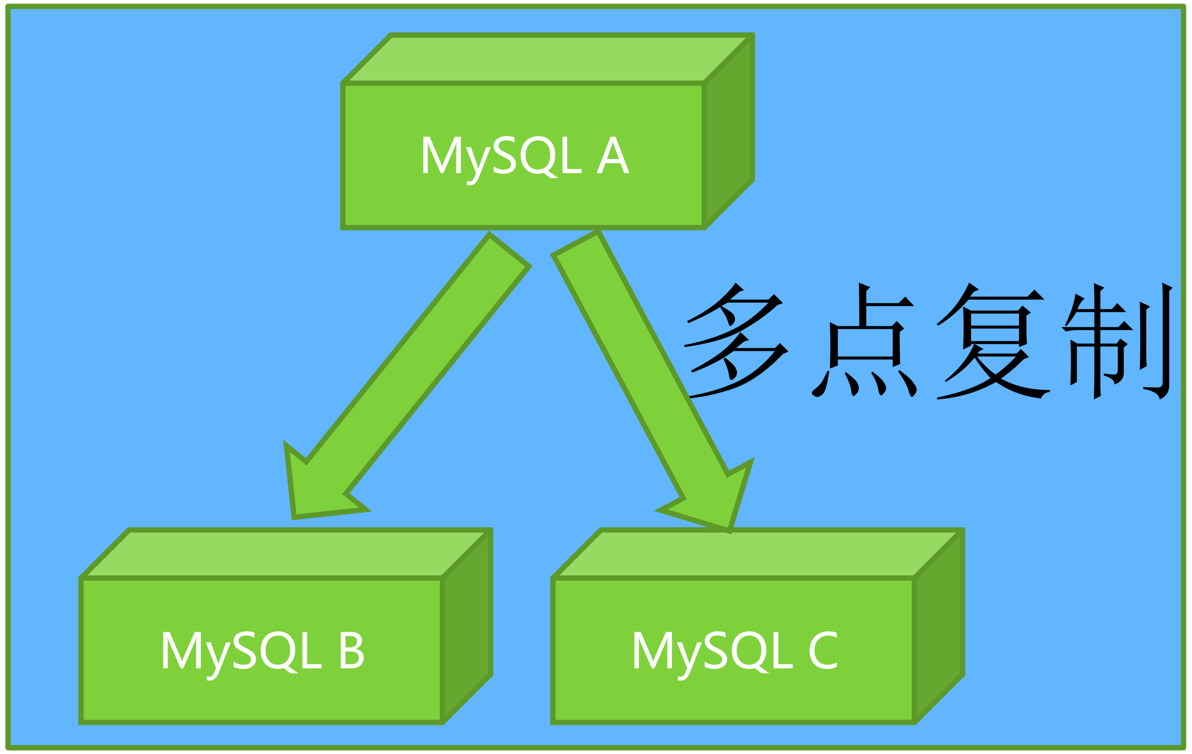
Mycat术语与原理

DataHost(MySQL Rep Group)

Mysql Master/Slave



Mysql Galera Cluster

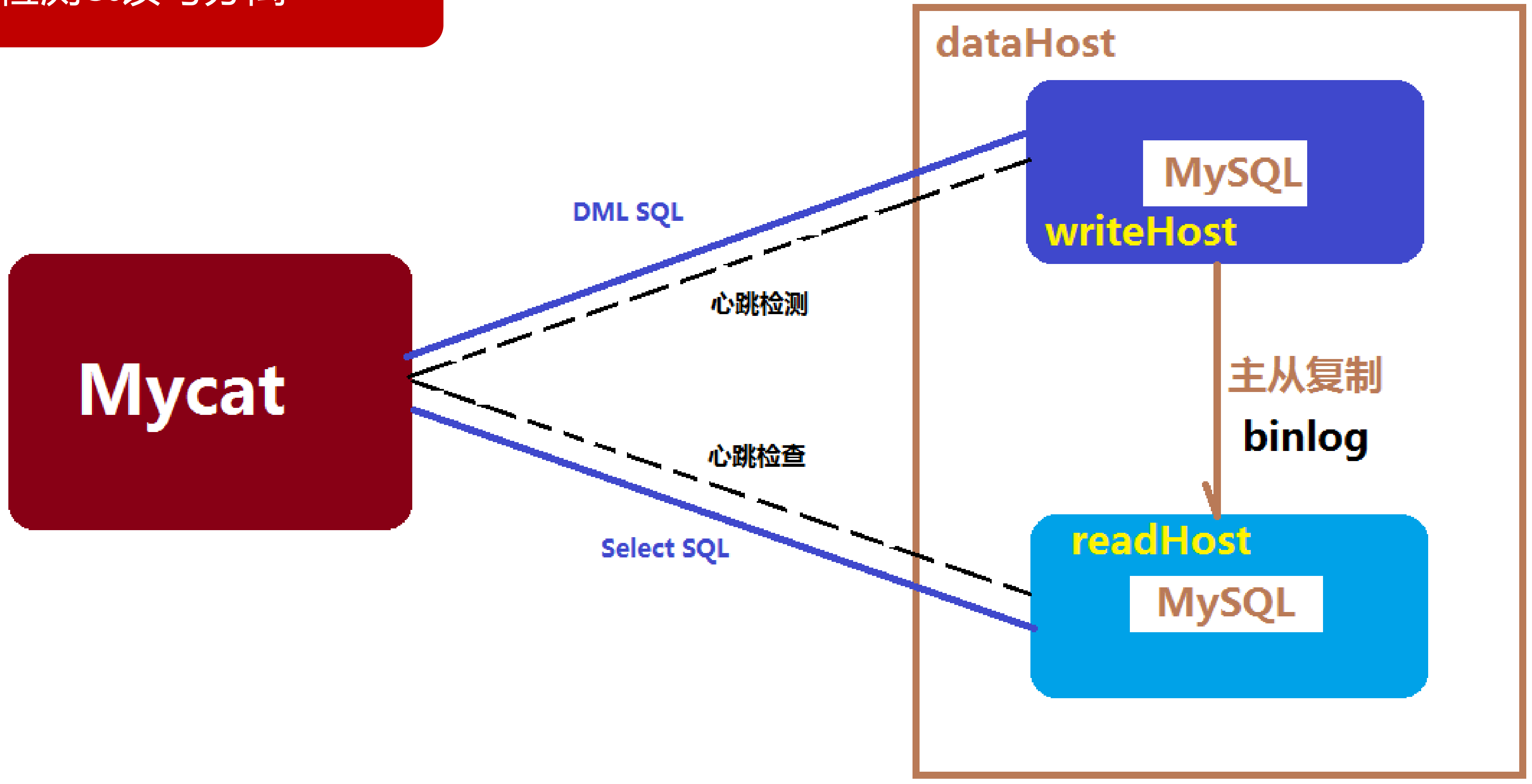


Mycat术语与原理

```
<dataNode name="dn1" dataHost="localhost1" database="db1" />
<dataNode name="dn2" dataHost="localhost1" database="db2" />
<dataNode name="dn3" dataHost="localhost1" database="db3" />

<dataHost name="localhost1" maxCon="1000" minCon="10" balance="0“  writeType="0" dbType="mysql"
dbDriver="native" switchType="1"  slaveThreshold="100">
<heartbeat>select user()</heartbeat>
<!-- can have multi write hosts -->
<writeHost host="hostM1" url="localhost:3306" user="root“  password="123456">
<!-- can have multi read hosts -->
</writeHost>
<writeHost host="hostS1" url="localhost:3316" user="root“ password="123456" />
```

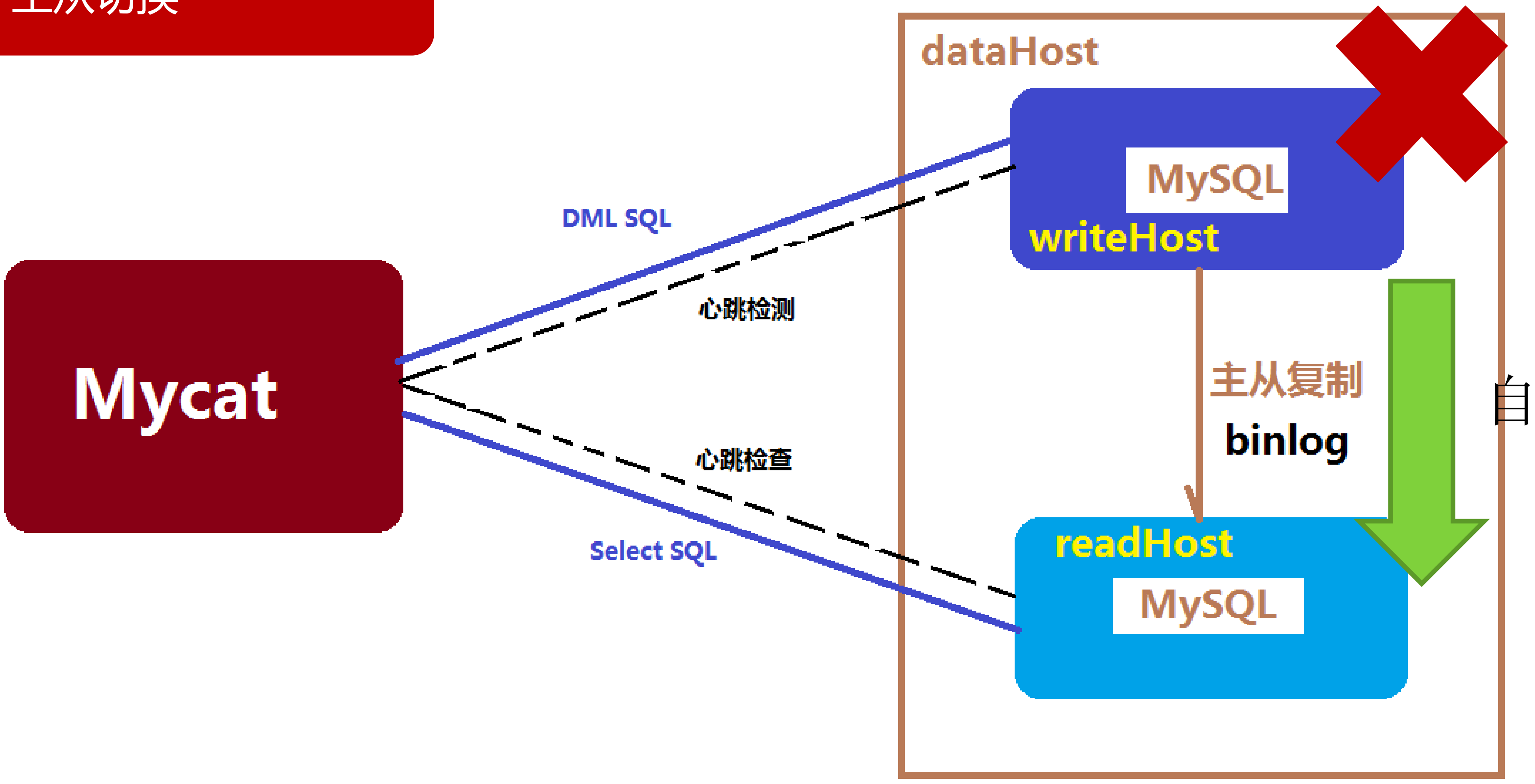
Mycat术语与原理

心跳检测&读写分离



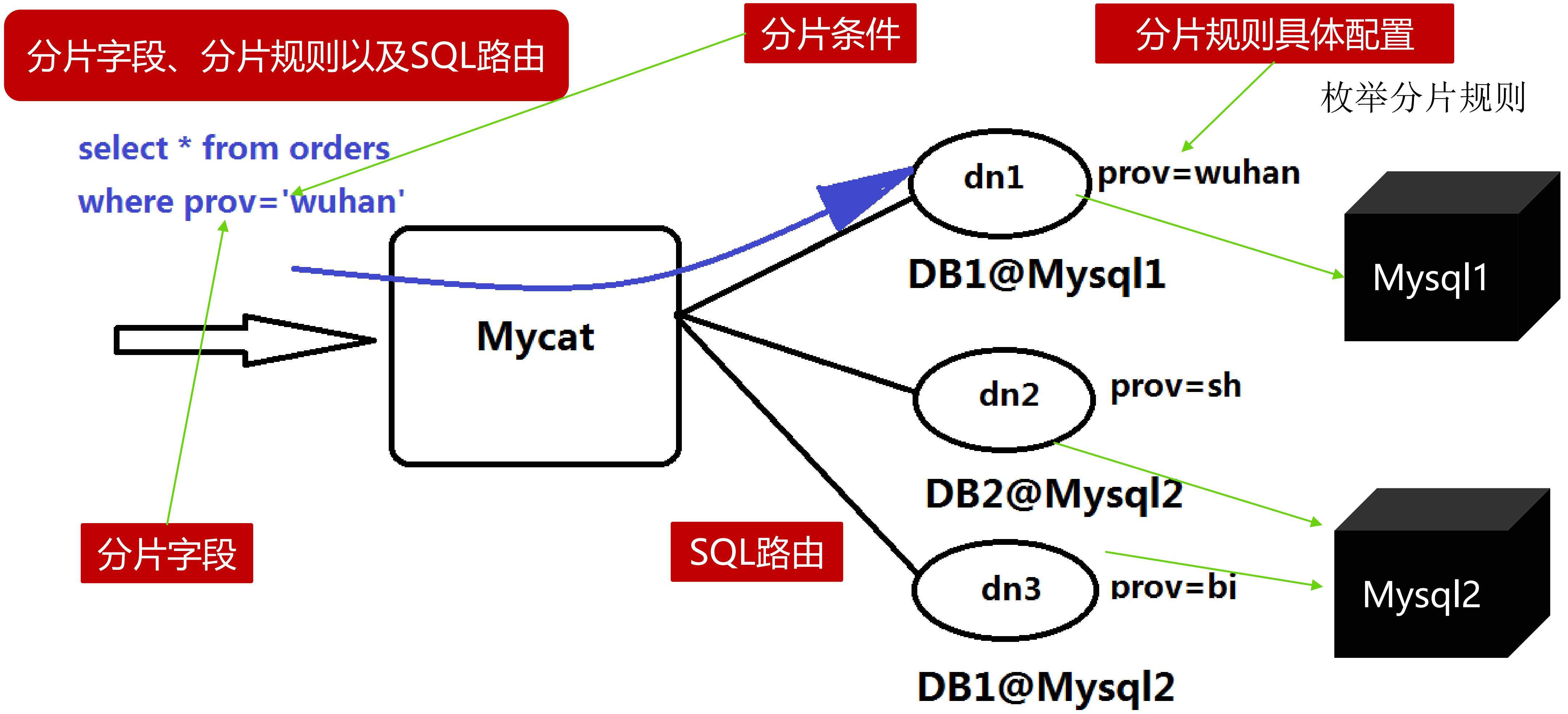
Mycat术语与原理

主从切换



自动切换到备机

Mycat术语与原理


分片字段、分片规则以及SQL路由
分片条件
分片规则具体配置
枚举分片规则
select * from orders
where prov='wuhan'
Mycat
dn1
prov=wuhan
DB1@Mysql1
Mysql1
dn2
prov=sh
DB2@Mysql2
dn3
prov=bi
DB1@Mysql2
Mysql2
分片字段
SQL路由

Mycat术语与原理

分片字段、分片规则

```
<table name="employee" primaryKey="ID" dataNode="dn1,dn2"          rule="sharding-by-intfile" />
```

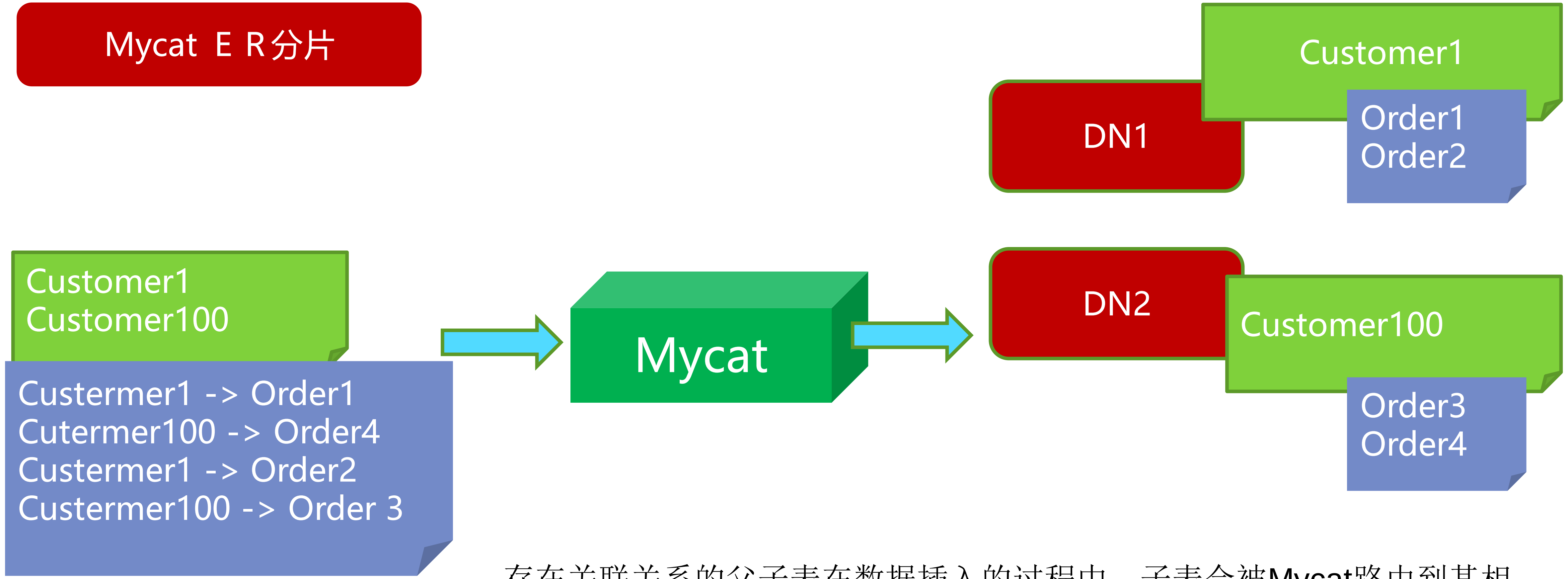
分片规则=分片字段+分片函数

```
<tableRule name="sharding-by-intfile">
            <rule>
            <columns>sharding_id</columns>
            <algorithm>hash-int</algorithm>
            </rule>   </tableRule>
```

简单映射函数，根据分片字段的值，返回分片Id

```
   <function name="hash-int"   class="org.opencloudb.route.function.PartitionByFileMap">
               <property name="mapFile">partition-hash-int.txt</property>
   </function>
```

Mycat术语与原理

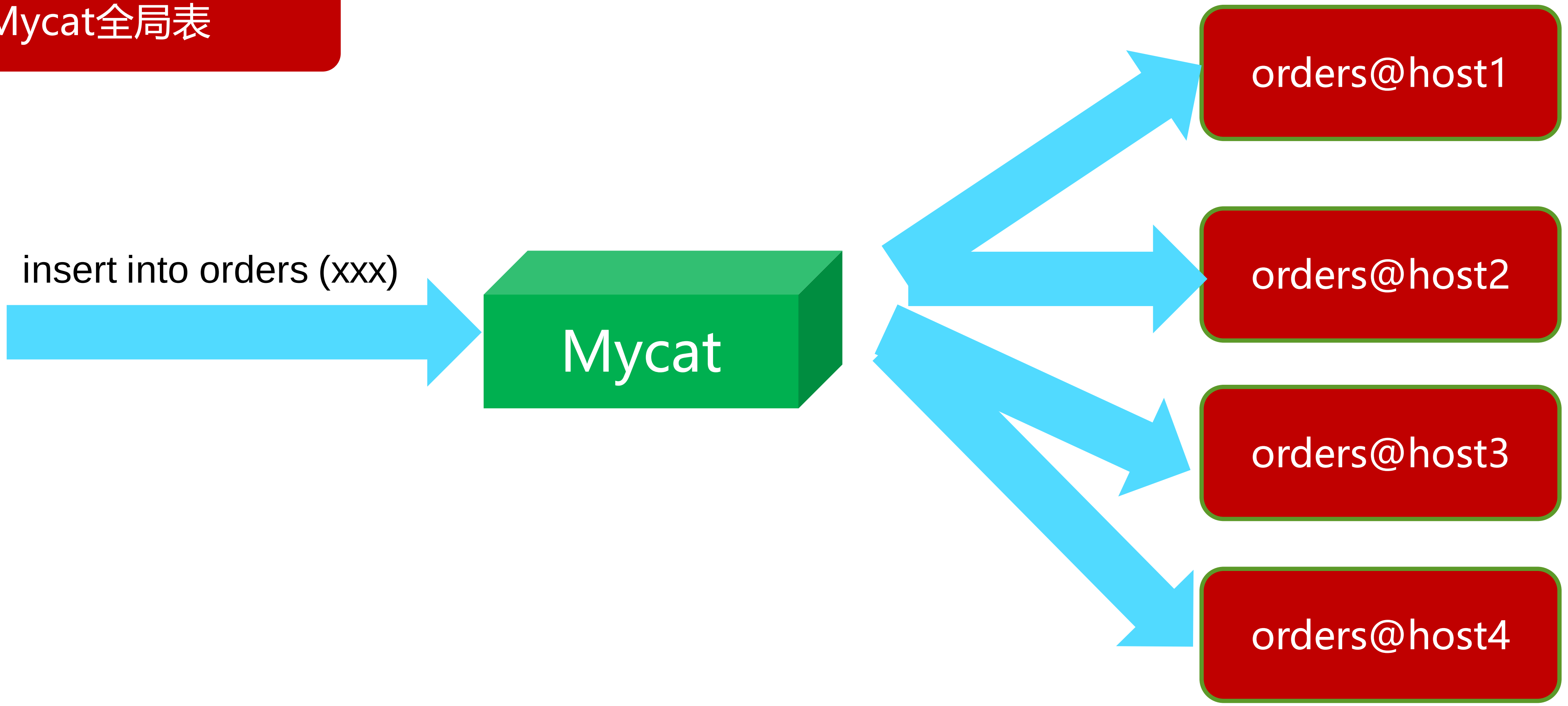


存在关联关系的父子表在数据插入的过程中，子表会被Mycat路由到其相关父表记录的节点上，从而父子表的Join查询可以下推到各个数据库节点上完成，这是最高效的跨节点Join处理技术，也是Mycat首创

<table name="employe

Mycat术语与原理

Mycat全局表



每个节点同时并发插入和更新数据，每个节点都可以读取数据，提升读性能的同时解决跨 节点Join的效率

<table name="employe

Mycat术语与原理

全局序列号

分片情况下，MySQL自身的自增长主键无法保证唯一

在数据库中建立一张表，存放sequence名称(name)，sequence当前值(current_value)，步长(increment) int类型每次读取多少个sequence，假设为K)等信息

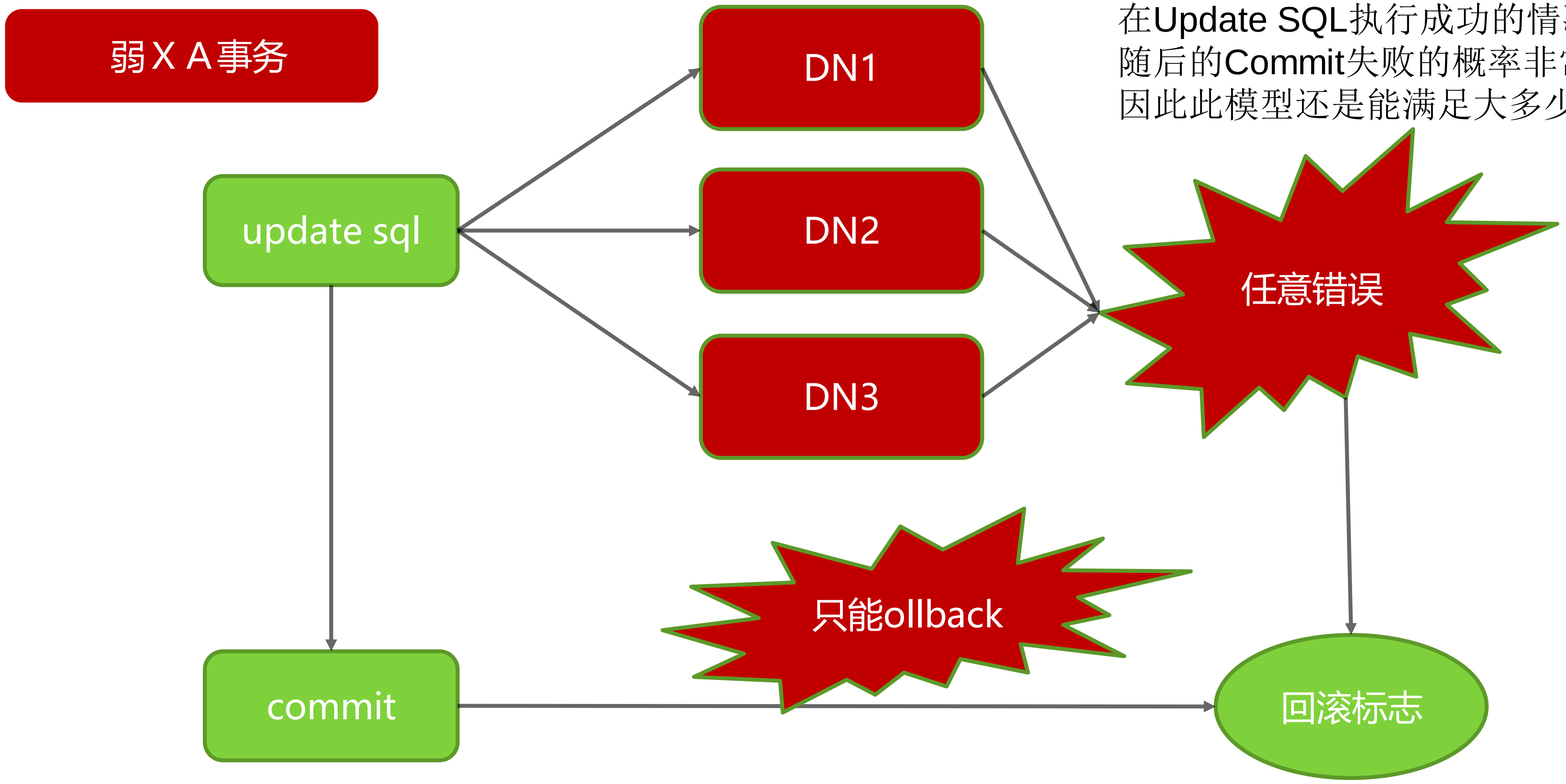
next value for MYCATSEQ_seqXXX

Mycat自增长主键

基于全局序列号，每个需要定义自增长主键的表创建一个全局序列号

Mycat术语与原理

在Update SQL执行成功的情况下，
随后的Commit失败的概率非常小
因此此模型还是能满足大多少应用的要求



Mycat术语与原理

Mycat Catlet (HBT技术)

Catlet是Java编写的一段程序，类似数据库中的存储过程，可以实现任意复杂SQL的Join、Group、Order等功能

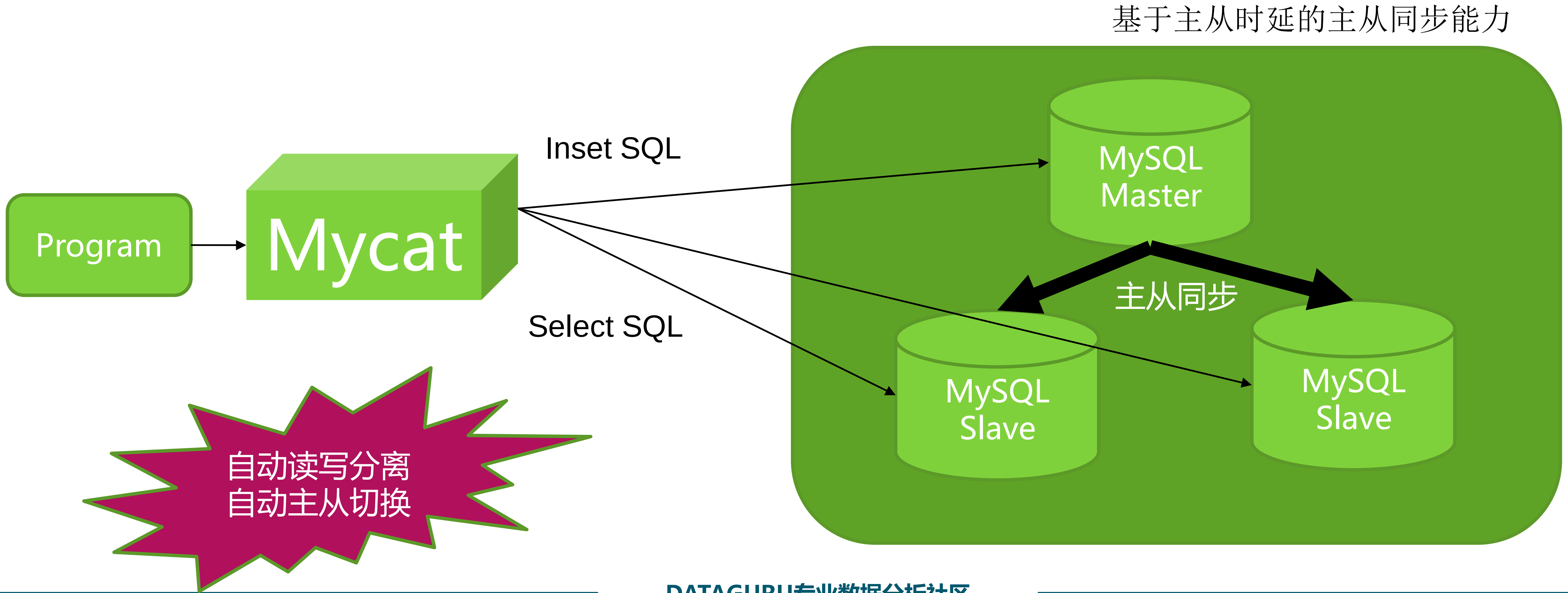
Java编程

热加载

完全自主控制SQL的结果集

Mycat基本功能介绍

一：高可用性与MySQL读写分离



Mycat基本功能介绍

事务内的SQL，默认走写节点，以注释/*balance*/开头，则会根据balance=“1”或“2”去获取 b. 非事务内的SQL，开启读写分离默认根据balance=“1”或“2”去获取，以注释/*balance*/开头则会走写解决部分已经开启读写分离，但是需要强一致性数据实时获取的场景走写

负载均衡类型，目前的取值有3种：
1. balance="0", 不开启读写分离机制，所有读操作都发送到当前可用的writeHost上。
2. balance="1"，全部的readHost与stand by writeHost参与select语句的负载均衡，简单的说，当双主双从模式(M1->S1，M2->S2，并且M1与 M2互为主备)，正常情况下，M2,S1,S2都参与select语句的负载均衡。
3. balance="2"，所有读操作都随机的在writeHost、readhost上分发。
4. balance="3"，所有读请求随机的分发到wiriterHost对应的readhost执行，writerHost不负担读压力

Mycat基本功能介绍

```
<dataHost name="localhost1" maxCon="1000" minCon="10" balance="0"          writeType="0"
dbType="mysql" dbDriver="native" switchType="2"  slaveThreshold="100">
<heartbeat>show slave status </heartbeat>
          <writeHost host="hostM1" url="localhost:3306" user="root"                          password="123456"
/>
          <writeHost host="hostS1" url="localhost:3316" user="root"                          password="123456"
/>
</dataHost>
```

Mycat心跳机制通过检测 show slave status 中的 "Seconds_Behind_Master", "Slave_IO_Running", "Slave_SQL_Running" 三个字段来确定当前主从同步的状态以及Seconds_Behind_Master主从复制时延，
当Seconds_Behind_Master>slaveThreshold时，读写分离筛选器会过滤掉此Slave机器

Mycat基本功能介绍

switchType="3" ,MyCAT心跳检查语句配置为 show status like ‘wsrep%’， 开启MySQL集群复制状态状态绑定的读写分离与切换机制

<dataHost name="localhost1" maxCon="1000" minCon="10" balance="0" writeType="0" dbType="mysql" dbDriver="native" switchType="3" > <heartbeat> show status like ‘wsrep%’</heartbeat> <writeHost host="hostM1" url="localhost:3306" user="root"password="123456">   </writeHost>   <writeHost host="hostS1"url="localhost:3316"user="root"password="123456" ></writeHost> </dataHost>

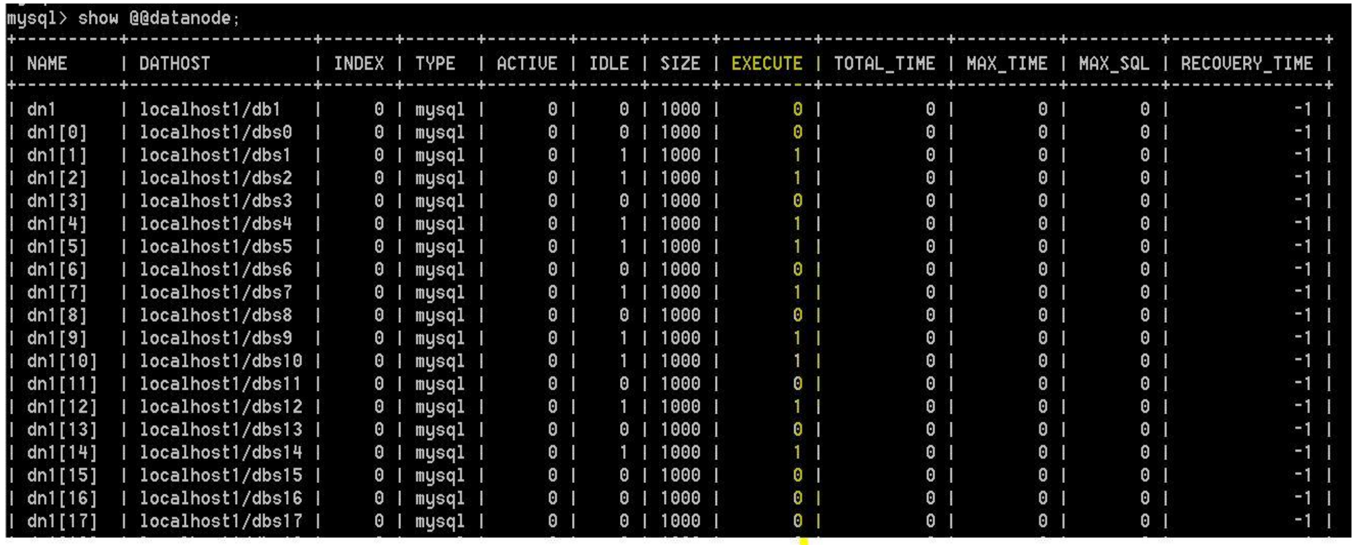
Mycat基本功能介绍

conf/log4j.xml中配置日志输出级别为debug时，当选择节点的时候，会输出如下日志：

```
16:37:21.660  DEBUG [Processor0-E3] (PhysicalDBPool.java:333) -select read source hostM1 for dataHost:localhost1
16:37:21.662  DEBUG [Processor0-E3] (PhysicalDBPool.java:333) -select read source hostM1 for dataHost:localhost1
```

根据这个信息，可以确定某个SQL发往了哪个读（写）节点，据此可以分析判断是否发生了读写分离。

用MySQL客户端连接到Mycat的9066管理端口，执行show @@datanode ，也能看出负载均衡的情况，其中execute字段表明该分片上执行过的SQL累计数：



```
mysql> show @@datanode;
+------------+--------------------+-------+-------+--------+------+------+----------+------------+----------+---------+---------------+
| NAME       | DATHOST            | INDEX | TYPE  | ACTIVE | IDLE | SIZE | EXECUTE  | TOTAL_TIME | MAX_TIME | MAX_SQL | RECOVERY_TIME |
+------------+--------------------+-------+-------+--------+------+------+----------+------------+----------+---------+---------------+
| dn1        | localhost1/db1     |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[0]     | localhost1/dbs0    |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[1]     | localhost1/dbs1    |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[2]     | localhost1/dbs2    |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[3]     | localhost1/dbs3    |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[4]     | localhost1/dbs4    |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[5]     | localhost1/dbs5    |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[6]     | localhost1/dbs6    |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[7]     | localhost1/dbs7    |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[8]     | localhost1/dbs8    |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[9]     | localhost1/dbs9    |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[10]    | localhost1/dbs10   |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[11]    | localhost1/dbs11   |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[12]    | localhost1/dbs12   |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[13]    | localhost1/dbs13   |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[14]    | localhost1/dbs14   |     0 | mysql |      0 |    1 | 1000 |        1 |          0 |        0 |       0 |            -1 |
| dn1[15]    | localhost1/dbs15   |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[16]    | localhost1/dbs16   |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
| dn1[17]    | localhost1/dbs17   |     0 | mysql |      0 |    0 | 1000 |        0 |          0 |        0 |       0 |            -1 |
```

Mycat主从切换

需要配置多个WriteHost节点

switchType属性
- -1 表示不自动切换 - 1 默认值，自动切换 - 2 基于MySQL主从同步的状态决定是否切换
  心跳语句为 show slave status
- 3 基于MySQL galary cluster的切换机制（适合集群）（1.4.1）
  心跳语句为 show status like ‘wsrep%’

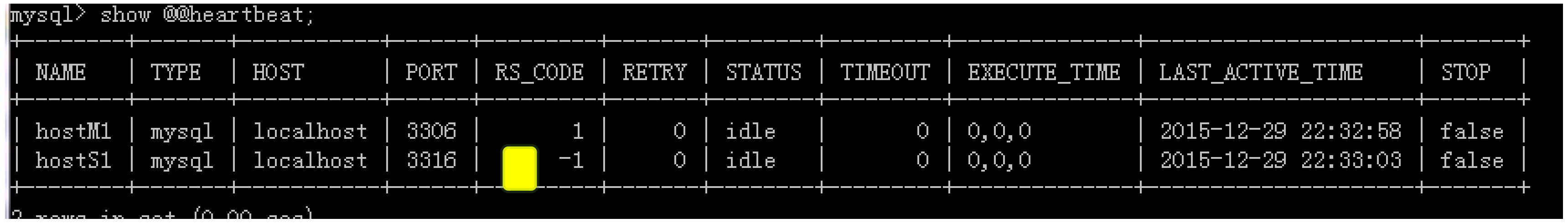
Mycat基本功能介绍

Mycat主从切换

conf/dnindex.properties文件记录了当前使用的是哪个写节点

```
#update
#Mon Oct 05 13:49:48 CST 2015
localhost1=0
```

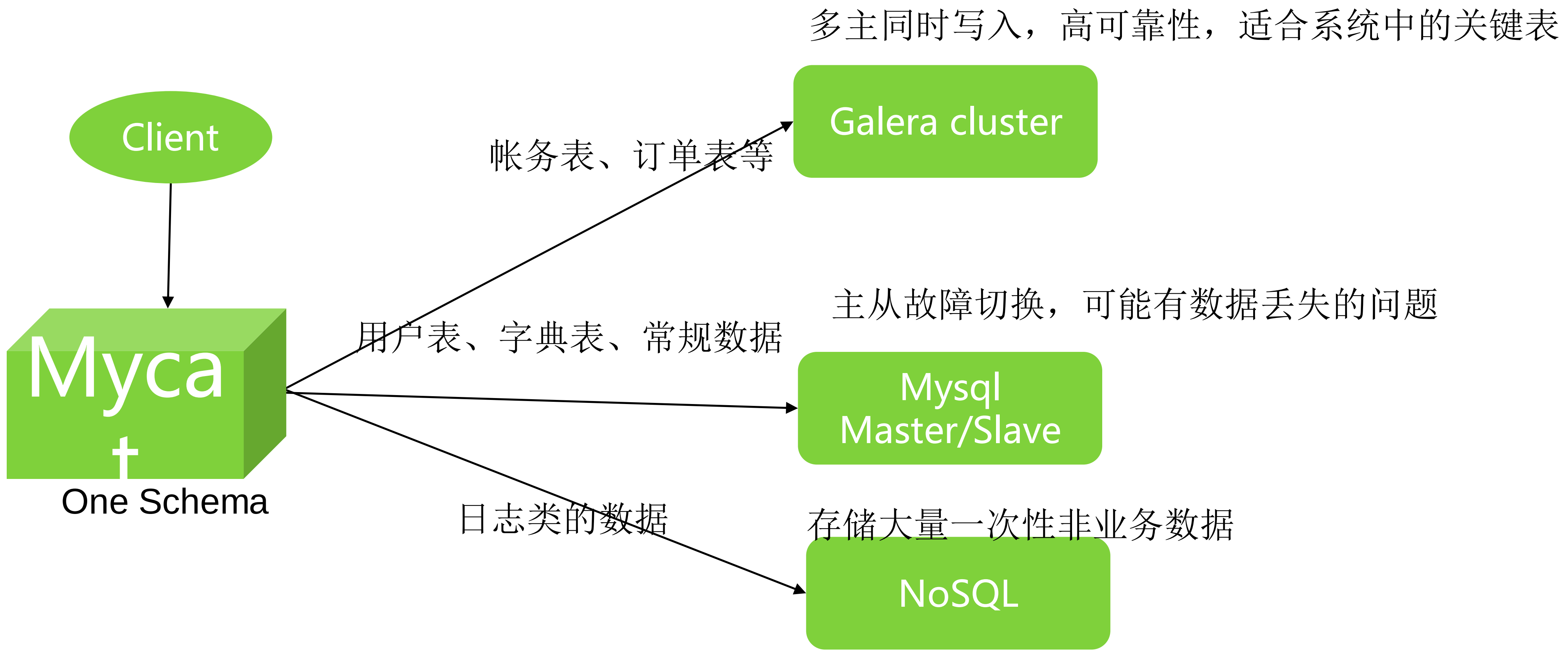
>**mysql -utest -ptest -P9066**



```
mysql> show @@heartbeat;
+--------+-------+-----------+------+---------+-------+--------+---------+--------------+---------------------+-------+
| NAME   | TYPE  | HOST      | PORT | RS_CODE | RETRY | STATUS | TIMEOUT | EXECUTE_TIME | LAST_ACTIVE_TIME    | STOP  |
+--------+-------+-----------+------+---------+-------+--------+---------+--------------+---------------------+-------+
| hostM1 | mysql | localhost | 3306 |       1 |     0 | idle   |       0 | 0,0,0        | 2015-12-29 22:32:58 | false |
| hostS1 | mysql | localhost | 3316 |      -1 |     0 | idle   |       0 | 0,0,0        | 2015-12-29 22:33:03 | false |
+--------+-------+-----------+------+---------+-------+--------+---------+--------------+---------------------+-------+
2 rows in set (0.00 sec)
```

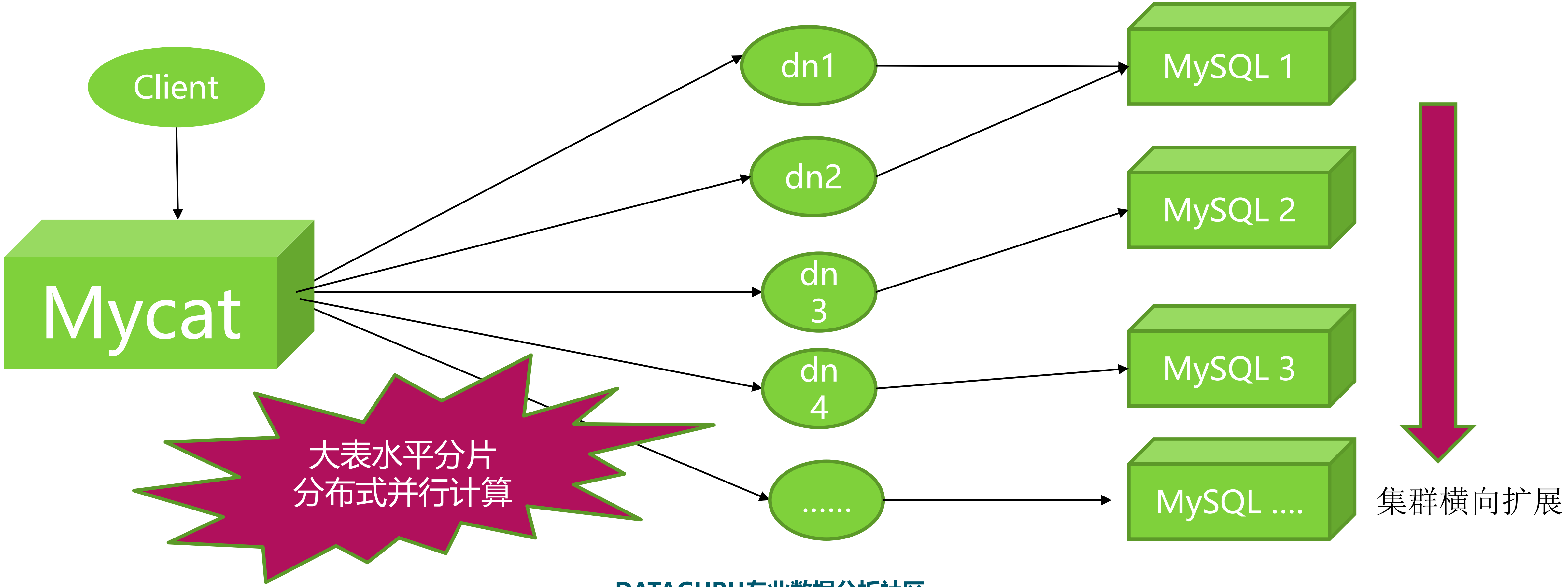
Mycat基本功能介绍

二：业务数据分级存储保障



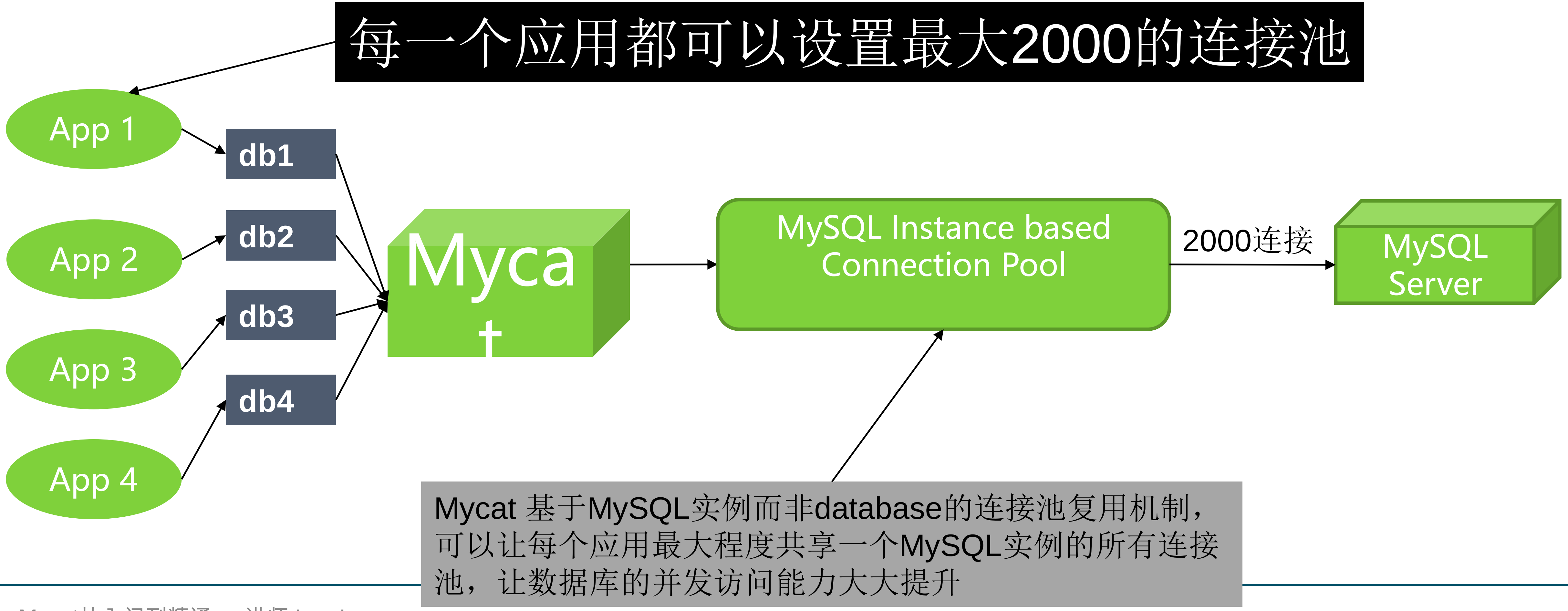
Mycat基本功能介绍

三：100亿大表水平分片，集群并行计算



Mycat基本功能介绍

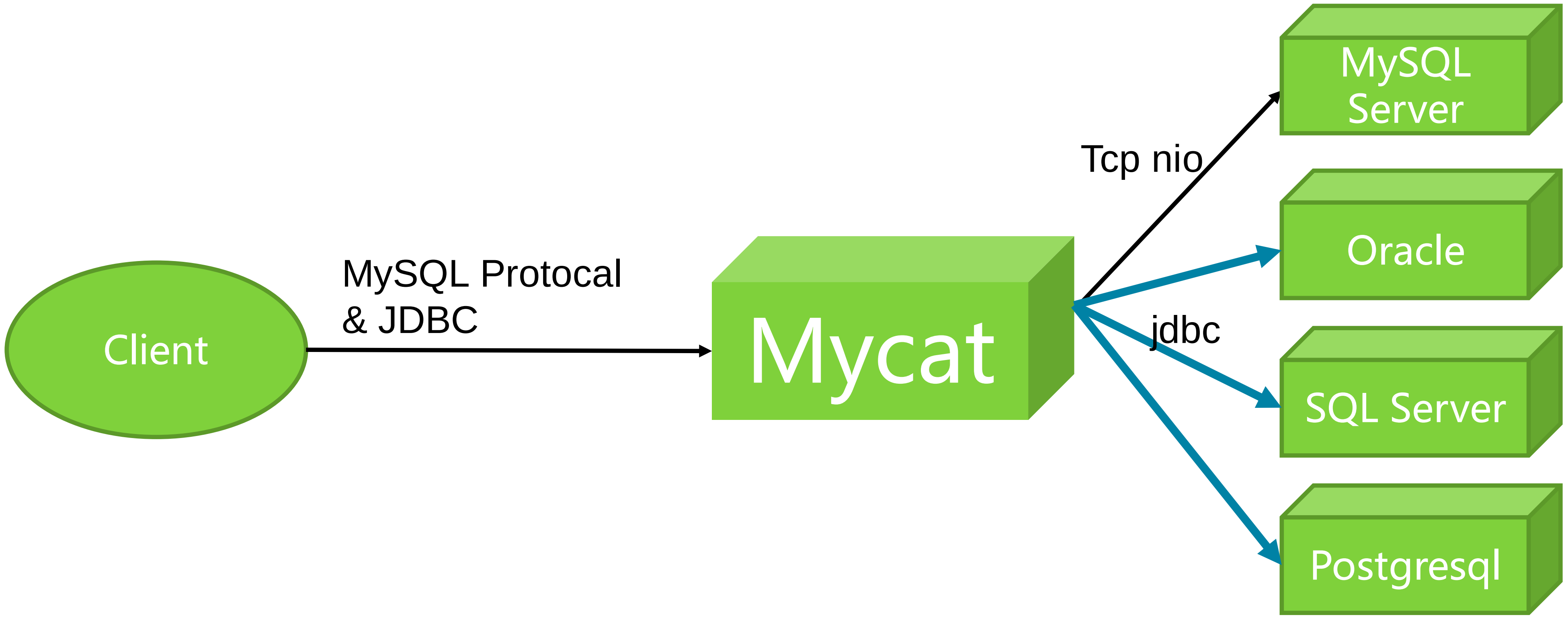
四：数据库路由器：大大提升数据库服务能力


每一个应用都可以设置最大2000的连接池
App 1
App 2
App 3
App 4
db1
db2
db3
db4
Mycat
MySQL Instance based Connection Pool
2000连接
MySQL Server

Mycat 基于MySQL实例而非database的连接池复用机制，可以让每个应用最大程度共享一个MySQL实例的所有连接池，让数据库的并发访问能力大大提升

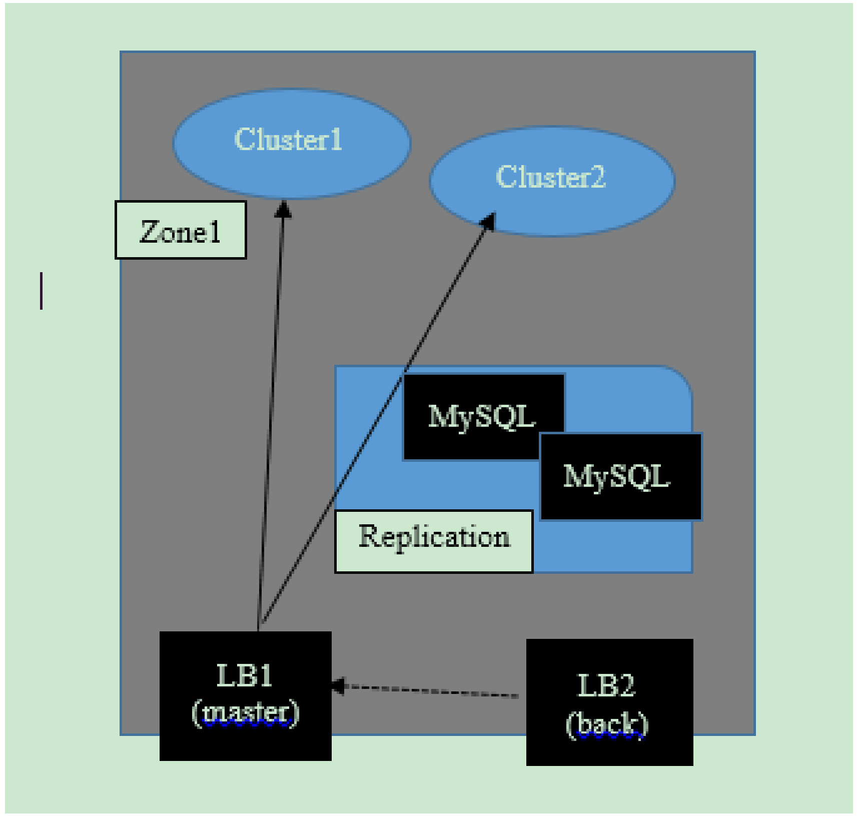
Mycat基本功能介绍

五：数据库路由器：整合多种数据源



Mycat配置入门

1.5的过度阶段，本地XML配置与基于ZK的yaml方式共存



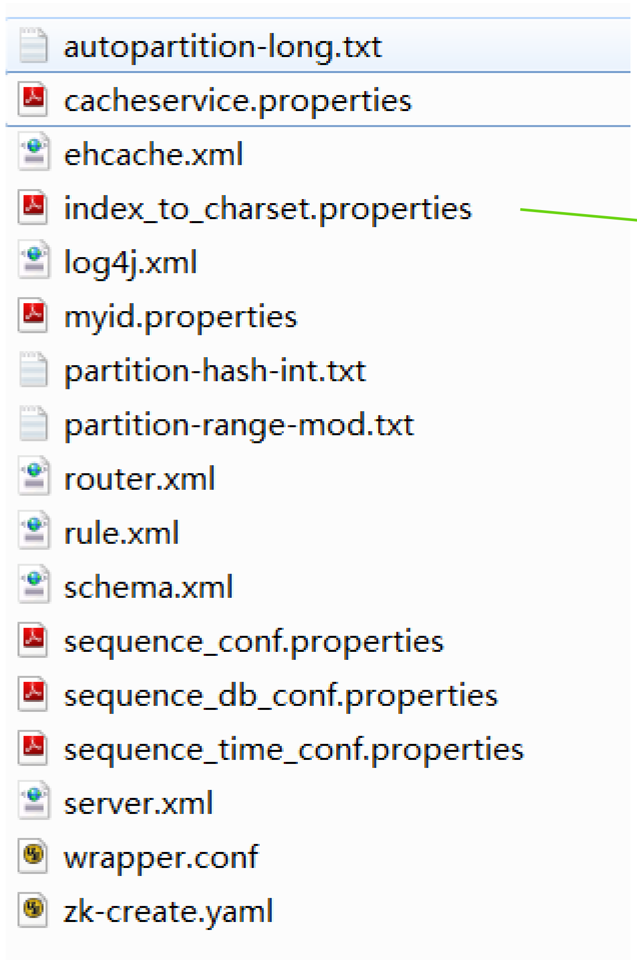
confg/zk-create.yaml用来初始化基于ZK的配置信息
config/myid.properties用来定义本Mycat节点的Id以及zk路径配置

```
loadZk=false
zkURL=127.0.0.1:2181
myid=mycat_fz_01
```

bin/init_zk_data.bat用来将上述配置信息导入到ZK中

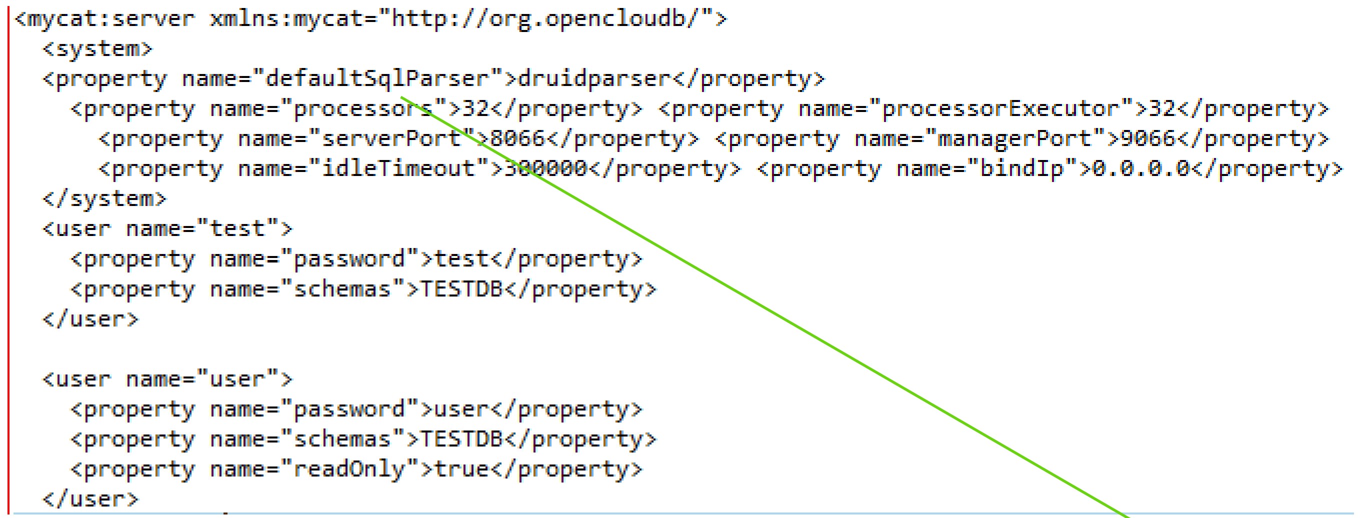
当修改好zk-create.yaml的文件内容，并且用init_zk_data工具导入到ZK中以后，就可以修改myid.properties里的loadZK属性为true，让MyCat从ZK加载

Mycat配置入门


autopartition-long.txt
cacheservice.properties
ehcache.xml
index_to_charset.properties
log4j.xml
myid.properties
partition-hash-int.txt
partition-range-mod.txt
router.xml
rule.xml
schema.xml
sequence_conf.properties
sequence_db_conf.properties
sequence_time_conf.properties
server.xml
wrapper.conf
zk-create.yaml

字符集映射关系

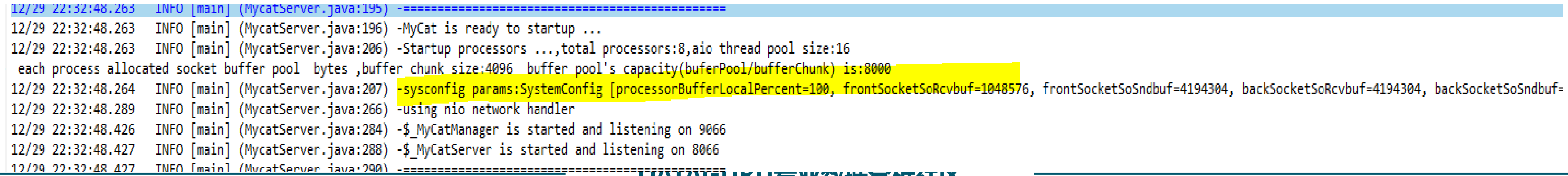
Mycat配置入门



```
<mycat:server xmlns:mycat="http://org.opencloudb/">
  <system>
  <property name="defaultSqlParser">druidparser</property>
    <property name="processors">32</property> <property name="processorExecutor">32</property>
      <property name="serverPort">8066</property> <property name="managerPort">9066</property>
      <property name="idleTimeout">300000</property> <property name="bindIp">0.0.0.0</property>
  </system>
  <user name="test">
    <property name="password">test</property>
    <property name="schemas">TESTDB</property>
  </user>

  <user name="user">
    <property name="password">user</property>
    <property name="schemas">TESTDB</property>
    <property name="readOnly">true</property>
  </user>
```

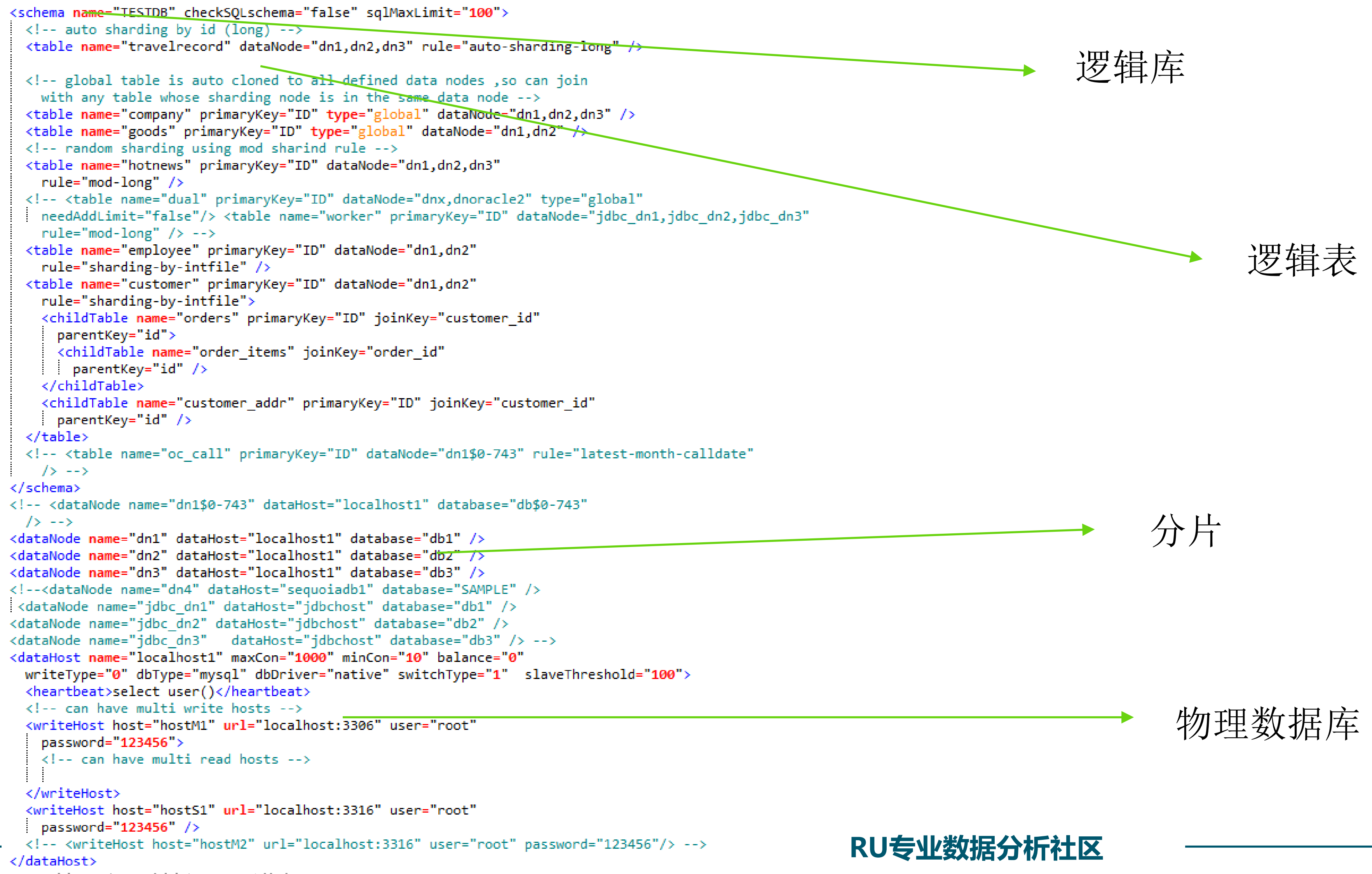
show @@sysparam;

系统参数



```
12/29 22:32:48.263  INFO [main] (MycatServer.java:195) -==============================================
12/29 22:32:48.263  INFO [main] (MycatServer.java:196) -MyCat is ready to startup ...
12/29 22:32:48.263  INFO [main] (MycatServer.java:206) -Startup processors ...,total processors:8,aio thread pool size:16
 each process allocated socket buffer pool  bytes ,buffer chunk size:4096  buffer pool's capacity(buferPool/bufferChunk) is:8000
12/29 22:32:48.264  INFO [main] (MycatServer.java:207) -sysconfig params:SystemConfig [processorBufferLocalPercent=100, frontSocketSoRcvbuf=1048576, frontSocketSoSndbuf=4194304, backSocketSoRcvbuf=4194304, backSocketSoSndbuf=
12/29 22:32:48.289  INFO [main] (MycatServer.java:266) -using nio network handler
12/29 22:32:48.426  INFO [main] (MycatServer.java:284) -$_MyCatManager is started and listening on 9066
12/29 22:32:48.427  INFO [main] (MycatServer.java:288) -$_MyCatServer is started and listening on 8066
12/29 22:32:48.427  INFO [main] (MycatServer.java:290) -==============================================
```

Mycat配置入门



```
<schema name="TESTDB" checkSQLschema="false" sqlMaxLimit="100">
  <!-- auto sharding by id (long) -->
  <table name="travelrecord" dataNode="dn1,dn2,dn3" rule="auto-sharding-long" />

  <!-- global table is auto cloned to all defined data nodes ,so can join
    with any table whose sharding node is in the same data node -->
  <table name="company" primaryKey="ID" type="global" dataNode="dn1,dn2,dn3" />
  <table name="goods" primaryKey="ID" type="global" dataNode="dn1,dn2" />
  <!-- random sharding using mod sharind rule -->
  <table name="hotnews" primaryKey="ID" dataNode="dn1,dn2,dn3"
    rule="mod-long" />
  <!-- <table name="dual" primaryKey="ID" dataNode="dnx,dnoracle2" type="global"
    needAddLimit="false"/> <table name="worker" primaryKey="ID" dataNode="jdbc_dn1,jdbc_dn2,jdbc_dn3"
    rule="mod-long" /> -->
  <table name="employee" primaryKey="ID" dataNode="dn1,dn2"
    rule="sharding-by-intfile" />
  <table name="customer" primaryKey="ID" dataNode="dn1,dn2"
    rule="sharding-by-intfile">
    <childTable name="orders" primaryKey="ID" joinKey="customer_id"
      parentKey="id">
      <childTable name="order_items" joinKey="order_id"
        parentKey="id" />
    </childTable>
    <childTable name="customer_addr" primaryKey="ID" joinKey="customer_id"
      parentKey="id" />
  </table>
  <!-- <table name="oc_call" primaryKey="ID" dataNode="dn1$0-743" rule="latest-month-calldate"
    /> -->
</schema>
<!-- <dataNode name="dn1$0-743" dataHost="localhost1" database="db$0-743"
  /> -->
<dataNode name="dn1" dataHost="localhost1" database="db1" />
<dataNode name="dn2" dataHost="localhost1" database="db2" />
<dataNode name="dn3" dataHost="localhost1" database="db3" />
<!--<dataNode name="dn4" dataHost="sequoiadb1" database="SAMPLE" />
 <dataNode name="jdbc_dn1" dataHost="jdbchost" database="db1" />
<dataNode name="jdbc_dn2" dataHost="jdbchost" database="db2" />
<dataNode name="jdbc_dn3"   dataHost="jdbchost" database="db3" /> -->
<dataHost name="localhost1" maxCon="1000" minCon="10" balance="0"
  writeType="0" dbType="mysql" dbDriver="native" switchType="1"  slaveThreshold="100">
  <heartbeat>select user()</heartbeat>
  <!-- can have multi write hosts -->
  <writeHost host="hostM1" url="localhost:3306" user="root"
    password="123456">
    <!-- can have multi read hosts -->

  </writeHost>
  <writeHost host="hostS1" url="localhost:3316" user="root"
    password="123456" />
  <!-- <writeHost host="hostM2" url="localhost:3316" user="root" password="123456"/> -->
</dataHost>
```

Table以及分片规则入门

```
<table name="goods" primaryKey="ID" type="global"
dataNode="dn1,dn2" />
<!-- random sharding using mod sharind rule -->
<table name="hotnews" primaryKey="ID" dataNode="dn1,dn2,dn3“
rule="mod-long" />
```

```
<function name="mod-long" class="org.opencloudb.route.function.PartitionByMod">
<!-- how many data nodes -->                    <property name="count">3</property>
</function>
```

分片函数返回的是dataNode的顺序号：0,1,2

Mycat配置入门　Table以及分片规则入门

primaryKey的特殊意义

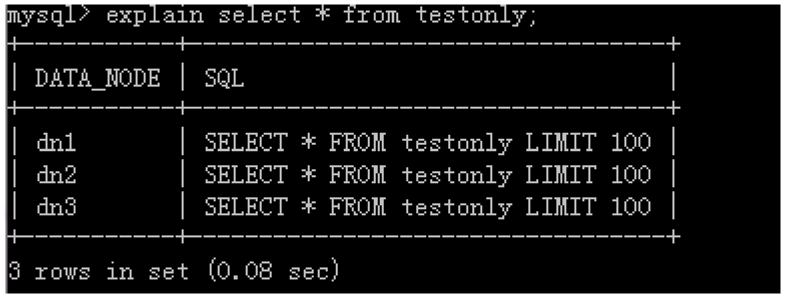
<tableRule name="age-mod-long"><rule><columns>**age**</columns<algorithm>mod-long</algorithm>
</rule></tableRule>

定义一个表，采用上述分片

<table name="TESTONLY" primaryKey="ID" dataNode="dn1,dn2,dn3" rule="age-mod-long" />

创建表：

create table testonly (id bigint not null primary key,age int);

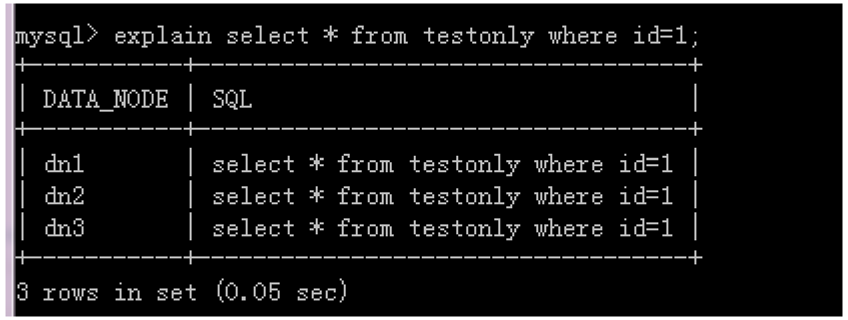


```
mysql> explain select * from testonly;
+-----------+-----------------------------------+
| DATA_NODE | SQL                               |
+-----------+-----------------------------------+
| dn1       | SELECT * FROM testonly LIMIT 100 |
| dn2       | SELECT * FROM testonly LIMIT 100 |
| dn3       | SELECT * FROM testonly LIMIT 100 |
+-----------+-----------------------------------+
3 rows in set (0.08 sec)
```

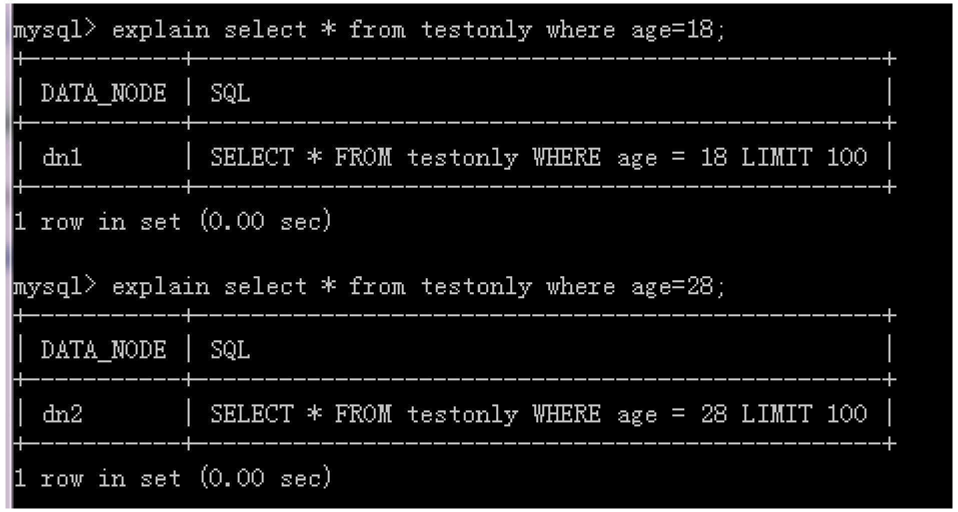
insert into testonly (id ,age) values (1,18);
insert into testonly (id ,age) values (2,28);
insert into testonly (id ,age) values (3,38);

Mycat配置入门　Table以及分片规则入门

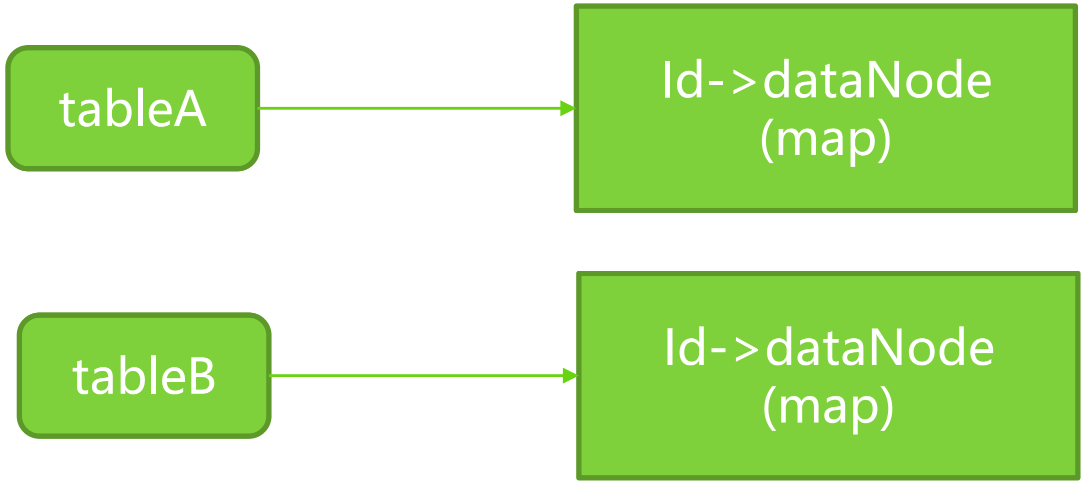
primaryKey的特殊意义



```
mysql> explain select * from testonly where id=1;
+-----------+---------------------------------+
| DATA_NODE | SQL                             |
+-----------+---------------------------------+
| dn1       | select * from testonly where id=1 |
| dn2       | select * from testonly where id=1 |
| dn3       | select * from testonly where id=1 |
+-----------+---------------------------------+
3 rows in set (0.05 sec)
```

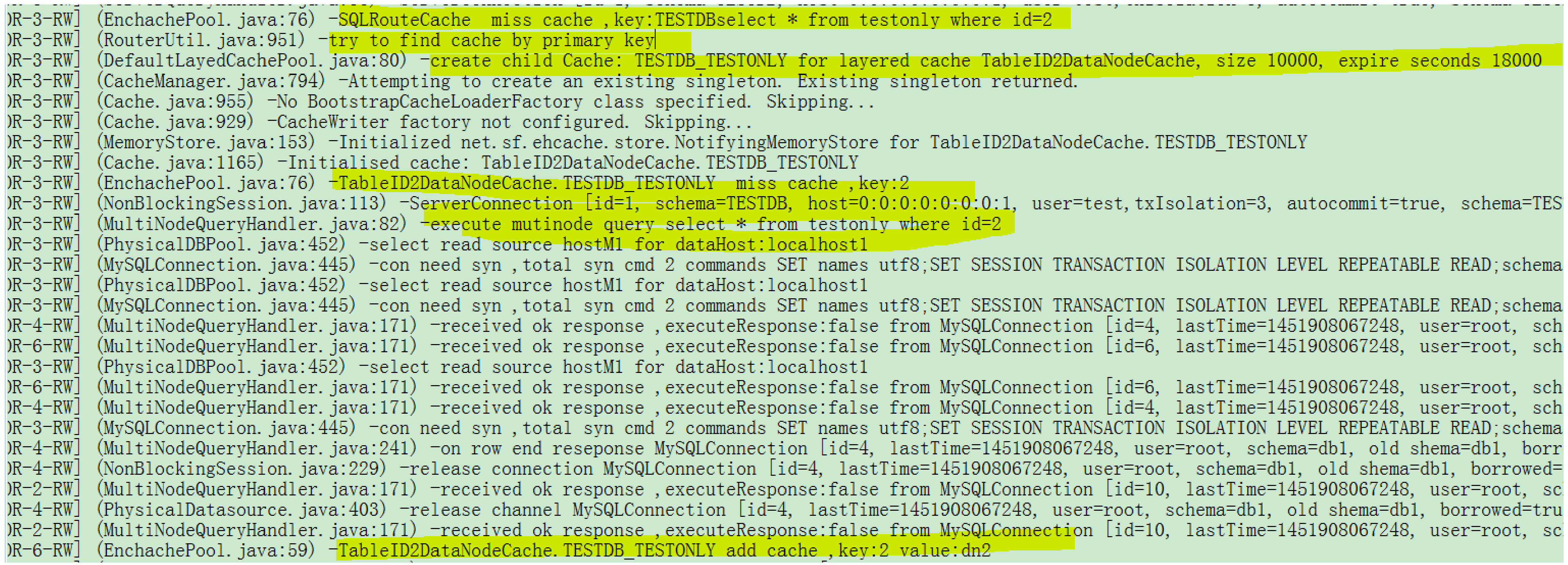


```
mysql> explain select * from testonly where age=18;
+-----------+--------------------------------------------+
| DATA_NODE | SQL                                        |
+-----------+--------------------------------------------+
| dn1       | SELECT * FROM testonly WHERE age = 18 LIMIT 100 |
+-----------+--------------------------------------------+
1 row in set (0.00 sec)

mysql> explain select * from testonly where age=28;
+-----------+--------------------------------------------+
| DATA_NODE | SQL                                        |
+-----------+--------------------------------------------+
| dn2       | SELECT * FROM testonly WHERE age = 28 LIMIT 100 |
+-----------+--------------------------------------------+
1 row in set (0.00 sec)
```



Mycat配置入门　Table以及分片规则入门

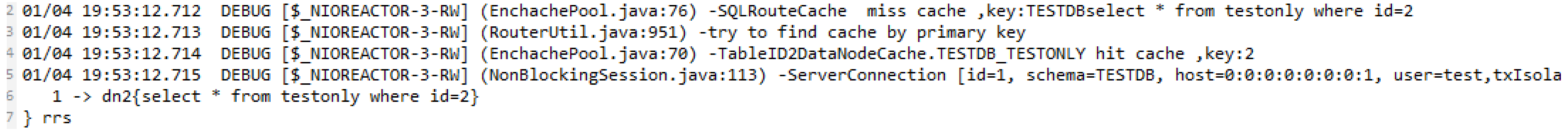
primaryKey的特殊意义



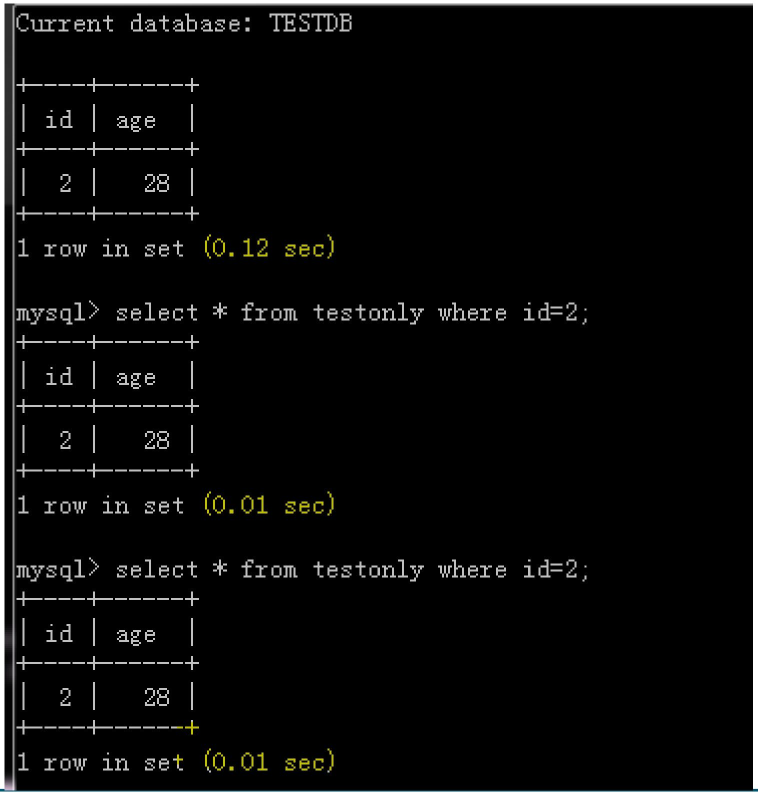
```
)R-3-RW] (EnchachePool.java:76) -SQLRouteCache  miss cache ,key:TESTDBselect * from testonly where id=2
)R-3-RW] (RouterUtil.java:951) -try to find cache by primary key
)R-3-RW] (DefaultLayedCachePool.java:80) -create child Cache: TESTDB_TESTONLY for layered cache TableID2DataNodeCache, size 10000, expire seconds 18000
)R-3-RW] (CacheManager.java:794) -Attempting to create an existing singleton. Existing singleton returned.
)R-3-RW] (Cache.java:955) -No BootstrapCacheLoaderFactory class specified. Skipping...
)R-3-RW] (Cache.java:929) -CacheWriter factory not configured. Skipping...
)R-3-RW] (MemoryStore.java:153) -Initialized net.sf.ehcache.store.NotifyingMemoryStore for TableID2DataNodeCache.TESTDB_TESTONLY
)R-3-RW] (Cache.java:1165) -Initialised cache: TableID2DataNodeCache.TESTDB_TESTONLY
)R-3-RW] (EnchachePool.java:76) -TableID2DataNodeCache.TESTDB_TESTONLY  miss cache ,key:2
)R-3-RW] (NonBlockingSession.java:113) -ServerConnection [id=1, schema=TESTDB, host=0:0:0:0:0:0:0:1, user=test,txIsolation=3, autocommit=true, schema=TES
)R-3-RW] (MultiNodeQueryHandler.java:82) -execute mutinode query select * from testonly where id=2
)R-3-RW] (PhysicalDBPool.java:452) -select read source hostM1 for dataHost:localhost1
)R-3-RW] (MySQLConnection.java:445) -con need syn ,total syn cmd 2 commands SET names utf8;SET SESSION TRANSACTION ISOLATION LEVEL REPEATABLE READ;schema
)R-3-RW] (PhysicalDBPool.java:452) -select read source hostM1 for dataHost:localhost1
)R-3-RW] (MySQLConnection.java:445) -con need syn ,total syn cmd 2 commands SET names utf8;SET SESSION TRANSACTION ISOLATION LEVEL REPEATABLE READ;schema
)R-4-RW] (MultiNodeQueryHandler.java:171) -received ok response ,executeResponse:false from MySQLConnection [id=4, lastTime=1451908067248, user=root, sch
)R-6-RW] (MultiNodeQueryHandler.java:171) -received ok response ,executeResponse:false from MySQLConnection [id=6, lastTime=1451908067248, user=root, sch
)R-3-RW] (PhysicalDBPool.java:452) -select read source hostM1 for dataHost:localhost1
)R-6-RW] (MultiNodeQueryHandler.java:171) -received ok response ,executeResponse:false from MySQLConnection [id=6, lastTime=1451908067248, user=root, sch
)R-4-RW] (MultiNodeQueryHandler.java:171) -received ok response ,executeResponse:false from MySQLConnection [id=4, lastTime=1451908067248, user=root, sch
)R-3-RW] (MySQLConnection.java:445) -con need syn ,total syn cmd 2 commands SET names utf8;SET SESSION TRANSACTION ISOLATION LEVEL REPEATABLE READ;schema
)R-4-RW] (MultiNodeQueryHandler.java:241) -on row end reseponse MySQLConnection [id=4, lastTime=1451908067248, user=root, schema=db1, old shema=db1, borr
)R-4-RW] (NonBlockingSession.java:229) -release connection MySQLConnection [id=4, lastTime=1451908067248, user=root, schema=db1, old shema=db1, borrowed=
)R-2-RW] (MultiNodeQueryHandler.java:171) -received ok response ,executeResponse:false from MySQLConnection [id=10, lastTime=1451908067248, user=root, sc
)R-4-RW] (PhysicalDatasource.java:403) -release channel MySQLConnection [id=4, lastTime=1451908067248, user=root, schema=db1, old shema=db1, borrowed=tru
)R-2-RW] (MultiNodeQueryHandler.java:171) -received ok response ,executeResponse:false from MySQLConnection [id=10, lastTime=1451908067248, user=root, sc
)R-6-RW] (EnchachePool.java:59) -TableID2DataNodeCache.TESTDB_TESTONLY add cache ,key:2 value:dn2
```

Mycat配置入门　Table以及分片规则入门

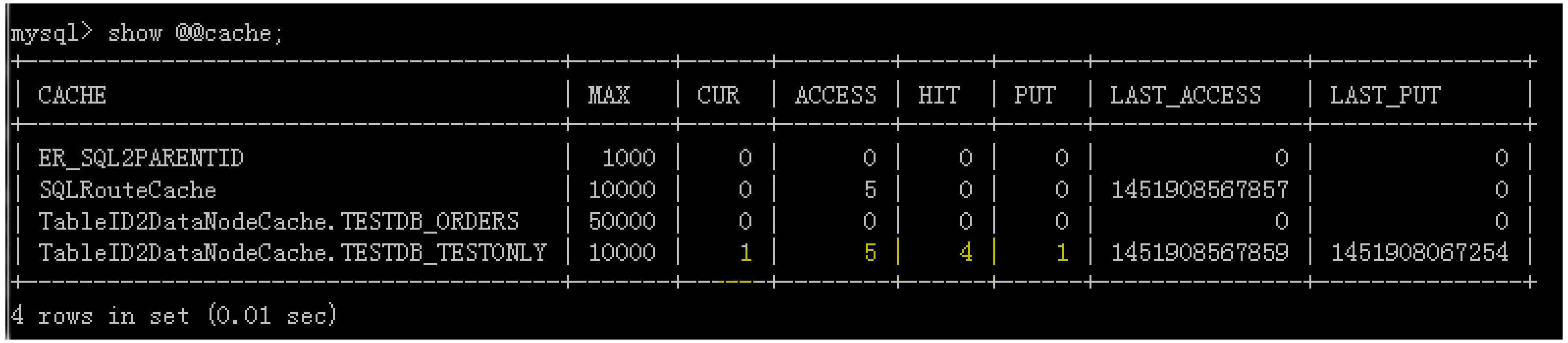
primaryKey的特殊意义



```
01/04 19:53:12.712  DEBUG [$_NIOREACTOR-3-RW] (EnchachePool.java:76) -SQLRouteCache  miss cache ,key:TESTDBselect * from testonly where id=2
01/04 19:53:12.713  DEBUG [$_NIOREACTOR-3-RW] (RouterUtil.java:951) -try to find cache by primary key
01/04 19:53:12.714  DEBUG [$_NIOREACTOR-3-RW] (EnchachePool.java:70) -TableID2DataNodeCache.TESTDB_TESTONLY hit cache ,key:2
01/04 19:53:12.715  DEBUG [$_NIOREACTOR-3-RW] (NonBlockingSession.java:113) -ServerConnection [id=1, schema=TESTDB, host=0:0:0:0:0:0:0:1, user=test,txIsola
   1 -> dn2{select * from testonly where id=2}
} rrs
```

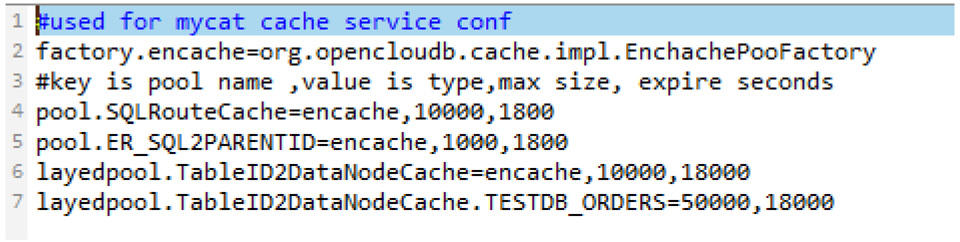


```
Current database: TESTDB

+----+------+
| id | age  |
+----+------+
|  2 |   28 |
+----+------+
1 row in set (0.12 sec)

mysql> select * from testonly where id=2;
+----+------+
| id | age  |
+----+------+
|  2 |   28 |
+----+------+
1 row in set (0.01 sec)

mysql> select * from testonly where id=2;
+----+------+
| id | age  |
+----+------+
|  2 |   28 |
+----+------+
1 row in set (0.01 sec)
```



```
mysql> show @@cache;
+-------------------------------------+-------+-----+--------+-----+-----+---------------+---------------+
| CACHE                               | MAX   | CUR | ACCESS | HIT | PUT | LAST_ACCESS   | LAST_PUT      |
+-------------------------------------+-------+-----+--------+-----+-----+---------------+---------------+
| ER_SQL2PARENTID                     |  1000 |   0 |      0 |   0 |   0 |             0 |             0 |
| SQLRouteCache                       | 10000 |   0 |      5 |   0 |   0 | 1451908567857 |             0 |
| TableID2DataNodeCache.TESTDB_ORDERS | 50000 |   0 |      0 |   0 |   0 |             0 |             0 |
| TableID2DataNodeCache.TESTDB_TESTONLY | 10000 |   1 |      5 |   4 |   1 | 1451908567859 | 1451908067254 |
+-------------------------------------+-------+-----+--------+-----+-----+---------------+---------------+
4 rows in set (0.01 sec)
```

cacheservice.properties



```
#used for mycat cache service conf
factory.encache=org.opencloudb.cache.impl.EnchachePooFactory
#key is pool name ,value is type,max size, expire seconds
pool.SQLRouteCache=encache,10000,1800
pool.ER_SQL2PARENTID=encache,1000,1800
layedpool.TableID2DataNodeCache=encache,10000,18000
layedpool.TableID2DataNodeCache.TESTDB_ORDERS=50000,18000
```

Mycat配置入门

index_to_charset.properties 做了MySQL字符集的映射关系

sequence_db_conf.properties，存放了全局序列号的配置信息

wrapper.conf是JVM的参数，包括堆大小问题

```
-XX:MaxDirectMemorySize=2G
wrapper.java.additional.6=-Dcom.sun.management.jmxremote
wrapper.java.additional.7=-Dcom.sun.management.jmxremote.port=1984
wrapper.java.additional.8=-Dcom.sun.management.jmxremote.authenticate=false
wrapper.java.additional.9=-Dcom.sun.management.jmxremote.ssl=false
wrapper.java.additional.10=-Xmx4G
wrapper.java.additional.11=-Xms1G
```

Thanks

FAQ时间