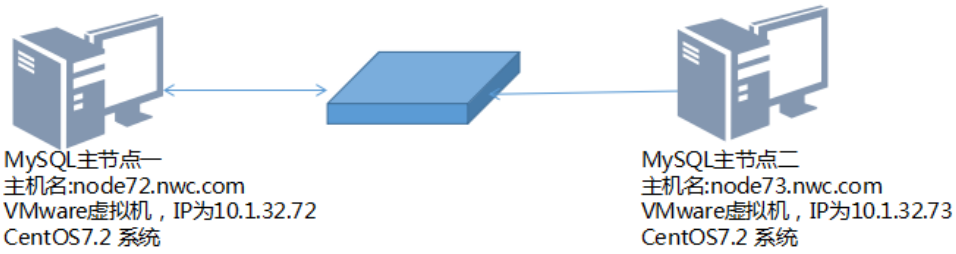
Mariadb数据库复制系列(二)：主主复制

实验二：MySQL双主复制架构的实现

> 双主的实现方式与主/从类似，仅是两个主机即使主节点，又是对方的从节点
> 双主模型容易造成数据的不一致性，因此要慎用！

1、实验环境

实验目的：
配置MySQL的双主模型复制功能



2、在两个节点上安装mariadb-server服务

```
[root@node72 ~]#
[root@node72 ~]# yum install -y mariadb-server   在node72上安装mysql服务
已加载插件：fastestmirror, langpacks
Loading mirror speeds from cached hostfile
正在解决依赖关系
--> 正在检查事务
---> 软件包 mariadb-server.x86_64.1.5.5.44-2.el7.centos 将被 安装
--> 正在处理依赖关系 mariadb(x86-64) = 1:5.5.44-2.el7.centos，它被软件包 1:mariadb-server-5.5.44-2.
el7.centos.x86_64 需要
--> 正在处理依赖关系 perl-DBI，它被软件包 1:mariadb-server-5.5.44-2.el7.centos.x86_64 需要
--> 正在处理依赖关系 perl-DBD-MySQL，它被软件包 1:mariadb-server-5.5.44-2.el7.centos.x86_64 需要
--> 正在处理依赖关系 perl(Data::Dumper)，它被软件包 1:mariadb-server-5.5.44-2.el7.centos.x86_64 需
要
--> 正在处理依赖关系 perl(DBI)，它被软件包 1:mariadb-server-5.5.44-2.el7.centos.x86_64 需要
--> 正在检查事务
---> 软件包 mariadb.x86_64.1.5.5.44-2.el7.centos 将被 安装
---> 软件包 perl-DBD-MySQL.x86_64.0.4.023-5.el7 将被 安装
---> 软件包 perl-DBI.x86_64.0.1.627-4.el7 将被 安装
--> 正在处理依赖关系 perl(RPC::PlServer) >= 0.2001，它被软件包 perl-DBI-1.627-4.el7.x86_64 需要
[root@node73 ~]#
[root@node73 ~]# yum install -y mariadb-server   在node73上安装mariadb-server
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
Resolving Dependencies
--> Running transaction check
---> Package mariadb-server.x86_64 1:5.5.44-2.el7.centos will be installed
--> Processing Dependency: mariadb(x86-64) = 1:5.5.44-2.el7.centos for package: 1:mariadb-server-5.
5.44-2.el7.centos.x86_64
--> Processing Dependency: perl-DBI for package: 1:mariadb-server-5.5.44-2.el7.centos.x86_64
--> Processing Dependency: perl-DBD-MySQL for package: 1:mariadb-server-5.5.44-2.el7.centos.x86_64
--> Processing Dependency: perl(Data::Dumper) for package: 1:mariadb-server-5.5.44-2.el7.centos.x86
_64
--> Processing Dependency: perl(DBI) for package: 1:mariadb-server-5.5.44-2.el7.centos.x86_64
```

3、修改两个节点的服务器配置文件

```
[root@node72 ~]# vim /etc/my.cnf          配置node72的服务配置文件，启用二进制日志、中继日志、设置唯一server id

[mysqld]
datadir=/var/lib/mysql
socket=/var/lib/mysql/mysql.sock
# Disabling symbolic-links is recommended to prevent assorted security risks
symbolic-links=0
# Settings user and group are ignored when systemd is used.
# If you need to run mysqld under a different user or group,
# customize your systemd unit file for mariadb according to the
# instructions in http://fedoraproject.org/wiki/Systemd
skip_name_resolve=ON 禁止名称解析
innodb_file_per_table=ON innodb存储引擎每表一个表空间
server_id=1 设定全局唯一的server id
log_bin=node72binlog 启用二进制日志，指明二进制日志的存放路径及名称
relay_log=node72relaylog 启用中继日志，指明中继日志的日志存储路径及名称
auto_increment_offset=1
auto_increment_increment=2 为避免自增长字段的值冲突，设置本机的自增长字段的值从1开始，每次增长2

[mysqld_safe]
log-error=/var/log/mariadb/mariadb.log
pid-file=/var/run/mariadb/mariadb.pid

#
# include all files from the config directory
#
[root@node73 ~]# vim /etc/my.cnf          在node73上也进行类似设定

[mysqld]
datadir=/var/lib/mysql
socket=/var/lib/mysql/mysql.sock
# Disabling symbolic-links is recommended to prevent assorted security risks
symbolic-links=0
# Settings user and group are ignored when systemd is used.
# If you need to run mysqld under a different user or group,
# customize your systemd unit file for mariadb according to the
# instructions in http://fedoraproject.org/wiki/Systemd
skip_name_resolve=ON
innodb_file_per_table=ON
server_id=2 node73的全局唯一server id为2
log_bin=node73binlog 设定二进制日志的路径
relay_log=node73relaylog 设定中继日志的路径
auto_increment_offset=2
auto_increment_increment=2 为避免自增长字段的冲突，设置本机自增长字段从2开始，每次增加2

[mysqld_safe]
log-error=/var/log/mariadb/mariadb.log
pid-file=/var/run/mariadb/mariadb.pid
```

4、两个节点上各自启动服务，各授权一个具有复制权限的用户

```
[root@node72 ~]# vim /etc/my.cnf
[root@node72 ~]#
[root@node72 ~]# systemctl start mariadb
[root@node72 ~]#
[root@node72 ~]# mysql
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 2
Server version: 5.5.44-MariaDB-log MariaDB Server

Copyright (c) 2000, 2015, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> GRANT REPLICATION SLAVE,REPLICATION CLIENT ON *.* TO 'node72user'@'10.1.32.73' ID
ENTIFIED BY '111111';
Query OK, 0 rows affected (0.02 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.01 sec)

MariaDB [(none)]>
```

在node72上修改完配置文件后，启动服务

授权一个具有复制权限的用户，仅允许该用户在node73上登录

```
[root@node73 ~]# vim /etc/my.cnf
[root@node73 ~]#
[root@node73 ~]# systemctl start mariadb
[root@node73 ~]# mysql
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 2
Server version: 5.5.44-MariaDB-log MariaDB Server

Copyright (c) 2000, 2015, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> GRANT REPLICATION SLAVE,REPLICATION CLIENT ON *.* TO 'node73user'@'10.1.32.72' ID
ENTIFIED BY '111111';
Query OK, 0 rows affected (0.01 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.00 sec)

MariaDB [(none)]>
```

在node73上启动服务

授权一个具有复制功能的用户，仅允许该用户在node72上登录

5、查看两个节点的二进制日志的状态

```
MariaDB [(none)]> SHOW MASTER LOGS;
+--------------------+-----------+
| Log_name           | File_size |
+--------------------+-----------+
| node72binlog.000001 |     30818 |
| node72binlog.000002 |   1069459 |
| node72binlog.000003 |       506 |
+--------------------+-----------+
3 rows in set (0.00 sec)

MariaDB [(none)]> SHOW MASTER STATUS;
+--------------------+----------+--------------+------------------+
| File               | Position | Binlog_Do_DB | Binlog_Ignore_DB |
+--------------------+----------+--------------+------------------+
| node72binlog.000003 |      506 |              |                  |
+--------------------+----------+--------------+------------------+
1 row in set (0.00 sec)

MariaDB [(none)]>
```

查看node72上使用的二进制日志文件列表以及当前正在使用的二进制日志文件的位置信息

```
MariaDB [(none)]>
MariaDB [(none)]> SHOW MASTER LOGS;
+--------------------+-----------+
| Log_name           | File_size |
+--------------------+-----------+
| node73binlog.000001 |     30818 |
| node73binlog.000002 |   1069459 |
| node73binlog.000003 |       506 |
+--------------------+-----------+
3 rows in set (0.01 sec)

MariaDB [(none)]> SHOW MASTER STATUS;
+--------------------+----------+--------------+------------------+
| File               | Position | Binlog_Do_DB | Binlog_Ignore_DB |
+--------------------+----------+--------------+------------------+
| node73binlog.000003 |      506 |              |                  |
+--------------------+----------+--------------+------------------+
1 row in set (0.02 sec)

MariaDB [(none)]>
```

在node73上查看服务器使用的二进制日志文件的列表和当前正在使用的二进制日志文件的位置信息

6、在两个节点上定义复制时的属性，启动复制线程

```
MariaDB [(none)]> CHANGE MASTER TO MASTER_HOST='10.1.32.73',MASTER_USER='node73user',MASTER_PASSWOR
D='111111',MASTER_LOG_FILE='node73binlog.000003',MASTER_LOG_POS=506;
Query OK, 0 rows affected (0.03 sec)

MariaDB [(none)]> START SLAVE;
Query OK, 0 rows affected (0.03 sec)

MariaDB [(none)]>
```

在node72上定义其作为node73的从节点时的复制属性，定义主服务器地址，登录主服务器的用户，密码，设定从主服务器的哪个二进制日志文件的哪个位置开始复制

启动复制线程

```
MariaDB [(none)]> CHANGE MASTER TO MASTER_HOST='10.1.32.72',MASTER_USER='node72user',MASTER_PASSWOR
D='111111',MASTER_LOG_FILE='node72binlog.000003',MASTER_LOG_POS=506;
Query OK, 0 rows affected (0.03 sec)

MariaDB [(none)]> START SLAVE;
Query OK, 0 rows affected (0.00 sec)

MariaDB [(none)]>
```

在node73上设定其作为node72从服务器时的复制属性信息，定义主服务器的地址，登录用户名、密码，从主服务器的哪个二进制文件的哪个位置开始复制

启动复制线程

7、查看两个节点上主从的状态信息

```
MariaDB [(none)]> SHOW SLAVE STATUS\G  在node72上查看其作为从节点时的状态信息
*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event  IO线程所处的状态
                  Master_Host: 10.1.32.73  主节点的地址
                  Master_User: node73user  登录主节点的用户
                  Master_Port: 3306
                Connect_Retry: 60 连接重试时间
              Master_Log_File: node73binlog.000003 主节点的二进制日志文件
          Read_Master_Log_Pos: 506 主节点的二进制日志所处的位置
               Relay_Log_File: node72relaylog.000002 中继日志
                Relay_Log_Pos: 532 中继日志位置
        Relay_Master_Log_File: node73binlog.000003
             Slave_IO_Running: Yes IO线程和SQL线程的状态
            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_Errno: 0
                   Last_Error:
                 Skip_Counter: 0
          Exec_Master_Log_Pos: 506
              Relay_Log_Space: 825
              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 当前从节点落后主节点的时长
Master_SSL_Verify_Server_Cert: No
                Last_IO_Errno: 0
                Last_IO_Error:
               Last_SQL_Errno: 0
               Last_SQL_Error:
  Replicate_Ignore_Server_Ids:
             Master_Server_Id: 2  主节点的server id
1 row in set (0.00 sec)

MariaDB [(none)]>
MariaDB [(none)]> SHOW SLAVE STATUS\G     在node73上查看其作为从节点时的状态信息
*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event
                  Master_Host: 10.1.32.72
                  Master_User: node72user
                  Master_Port: 3306
                Connect_Retry: 60
              Master_Log_File: node72binlog.000003
          Read_Master_Log_Pos: 506
               Relay_Log_File: node73relaylog.000002
                Relay_Log_Pos: 532
        Relay_Master_Log_File: node72binlog.000003
             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_Errno: 0
                  Last_Error:
                Skip_Counter: 0
         Exec_Master_Log_Pos: 506
             Relay_Log_Space: 825
             Until_Condition: None
              Until_Log_File:
```

8、验证主从是否配置成功