搭建 keepalived + MHA 实现mysql高可用测试报告

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摘要

本次自建mysql高可用方案采用MHA+KEEPALIVE 方式 搭配HAVIP 搭建

MHA 是当 master 出现故障，挑选一个 slave 作为新的 master 并构建成新的 主从架构的管理工具。从 master 出现故障到构建成新的主从架构时间是 10-30 秒。在 master 出现故障时可能会出现 slave 同步的数据不一致的现象，此工具可以自动应用差异的中继日志到其他 slave 上保证数据的一致性。

Mha 优点

1.M aster crash 时可以快速的进行故障切换。

9-12 秒内可以检测到 master 故障， 7-10 秒内可以关闭 master 机器避免脑裂，在几秒内可以应用差异日志，并构建新的主从架构，整个过程大约在 10-30 秒内可以完成，最大化的减少故障修复时间。

2.M aster crash 时可以最大化的减少数据丢失

当 master crash 时 MHA 自动检测选择数据同步最全的 slave，并把差异日 志应用到其他 slave 上， 以保障数据的一致性。使用半同步复制，可以大大降低数据丢失的风险。MHA可以与半同步复制结合起来。如果只有一个slave已经收到了最新的二进制日志，MHA可以将最新的二进制日志应用于其他所有的slave服务器上，因此可以保证所有节点的数据一致性。

3.Semi-Synchronous Replication可以最大化的减少数据的丢失。

MHA 的更改升级配置等不影响线上正在运行的数据库 使用 mha 不需要增加太多的服务器 MHA 由 MHA Manager 和 MHA Node 组成。 MHA Node 运行在 MYSQL 服务器上， 所以不会因为 MHA node 增加新的服务器。MHA Manager 通常需要独立运行在一台服务器上，所以你需要增加一台服务器用于监控管理运行 MHA Manager，但 是一台服务器上的 MHA Manager 可以同时监控管理多达百台 master，所以总的 来说服务器增加不会太多。MHA Manger 也可以运行在一台 slave 上，这样总的 服务器数也不会增加。

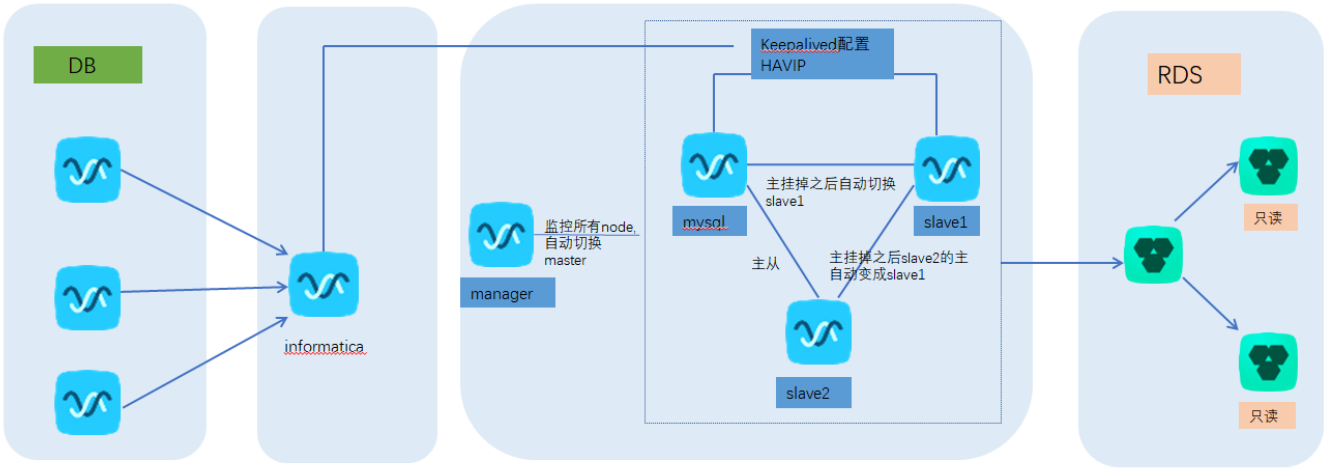
4.原来应用系统整体性能不会降低太多

MHA 工作在异步或半同步的主从架构上。当监控 master 时，MHA 会每隔几 Mha 部署测试文档 5 秒 （默认 3 秒） 向 master 发出 ping 包并且不需要大的 sql 语句用于监控 master 的健康状况。Slave 需要开启 binlog，整体性能不会有太大的降低。

5.MHA 适合任何存储引擎

只要能主从复制的存储引擎它都支持，不限于支持事物的 innodb 引擎。

架构图



安装

准备4台服务器

MHAmanager节点：10.200.63.172

主：10.200.63.167

slave1：10.200.163.169

slave2：10.200.163.170

配置互相无交互

```
manager
ssh-keygen
ssh-copy-id 10.200.63.169
ssh-copy-id 10.200.63.170
ssh-copy-id 10.200.63.167
```

```
[root@iZzm08z1bbjy9xjgxy33taZ ~]# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
0b:3d:fd:cc:4f:6e:d8:a7:5b:c4:35:0a:37:86:50:76
root@iZzm08z1bbjy9xjgxy33taZ
The key's randomart image is:
+--[ RSA 2048]----+
|         ..o E   |
|          o o    |
|           o + ..|
|       . .  + o.o|
|      . S .  .  o|
|       . o +   . |
|        .   +o. .|
|            .+o..|
|             .=+ |
+-----------------+
[root@iZzm08z1bbjy9xjgxy33taZ ~]#  ssh-copy-id 10.200.63.167
The authenticity of host '10.200.63.167 (10.200.63.167)' can't be
established.
ECDSA key fingerprint is 0f:73:40:c8:39:4b:10:1f:9c:4f:56:bf:36:5e:2d:4a.
Are you sure you want to continue connecting (yes/no)? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to
filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are
prompted now it is to install the new keys
root@10.200.63.167's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh '10.200.63.167'"
and check to make sure that only the key(s) you wanted were added.

[root@iZzm08z1bbjy9xjgxy33taZ ~]#  ssh-copy-id 10.200.63.169
The authenticity of host '10.200.63.169 (10.200.63.169)' can't be
established.
ECDSA key fingerprint is 98:b0:d3:58:8f:5c:6b:a9:c3:28:c9:a0:c2:34:2a:4d.
Are you sure you want to continue connecting (yes/no)? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to
filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are
prompted now it is to install the new keys
root@10.200.63.169's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh '10.200.63.169'"
```

```
and check to make sure that only the key(s) you wanted were added.

[root@iZzm08z1bbjy9xjgxy33taZ ~]#  ssh-copy-id 10.200.63.170
The authenticity of host '10.200.63.170 (10.200.63.170)' can't be
established.
ECDSA key fingerprint is 67:af:b8:72:26:8e:35:eb:cf:00:60:28:76:8b:a1:79.
Are you sure you want to continue connecting (yes/no)? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to
filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are
prompted now it is to install the new keys
root@10.200.63.170's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh '10.200.63.170'"
and check to make sure that only the key(s) you wanted were added.
```

配置主从半同步

配置主从阶段很重要，一定要事先确定主从搭建好，以免导致后续MHA切换的时候发生各种报错

```
#



1  mysql5.7.17
2
3
MariaDB [(none)]> install plugin rpl_semi_sync_master soname
'semisync_master.so';
MariaDB [dba]> INSTALL PLUGIN rpl_semi_sync_slave SONAME
'semisync_slave.so';
4

rpl_semi_sync_master_enabled=1
rpl_semi_sync_master_timeout=1000
rpl_semi_sync_slave_enabled=1
relay_log_purge=0
skip-name-resolve
#socket=/usr/mysql.sock
#auto_increment_offset = 2
#auto_increment_increment = 2
read_only=1
slave-skip-errors=1396
5
6
grant replication slave on *.* to slave@'10.200.63.167' identified by
'abc123';
grant replication slave on *.* to slave@'10.200.63.169' identified by
'abc123';
grant replication slave on *.* to slave@'10.200.63.170' identified by
'abc123';
grant all privileges on *.* to mha_mon@'%' identified by '123';
grant super, select, replication slave, replication client ,lock tables on
*.* to replication@'%' identified by 'zyadmin123';
flush privileges;


slave MHA
mha_mon MHA


6
```

```
mysqldump -uroot -p -A --opt --set-gtid-purged=OFF
--default-character-set=utf8 --single-transaction --hex-blob
--skip-triggers --master-data=2 --flush-logs --max_allowed_packet=824288000
> /alidata/install/mysqlmasterall.sql


slave1
1  mysql5.7.17
2
3
root@MySQL-01 15:07:  [(none)]> install plugin rpl_semi_sync_master soname
'semisync_master.so';
root@MySQL-01 15:07:  [(none)]> INSTALL PLUGIN rpl_semi_sync_slave SONAME
'semisync_slave.so';
4

rpl_semi_sync_master_enabled=1
rpl_semi_sync_master_timeout=1000
rpl_semi_sync_slave_enabled=1
relay_log_purge=0
skip-name-resolve
#socket=/usr/mysql.sock
#auto_increment_offset = 2
#auto_increment_increment = 2
read_only=1
slave-skip-errors=1396
5
6 root@MySQL-01 15:07:  [(none)]> reset master;
7
mysql -uroot -p < /alidata/install/mysqlmasterall.sql
8
change master to
master_host='10.200.63.167',master_user='slave',master_password='abc123',M
ASTER_LOG_FILE='mybinlog.000023',MASTER_LOG_POS=274;
gtid
GTID
gtid_mode=on
enforce_gtid_consistency=1


sed -n '22p' /alidata/install/mysqlmasterall.sql


slave2 slave


1  mysql5.7.17
2
3
root@MySQL-01 15:07:  [(none)]> install plugin rpl_semi_sync_master soname
'semisync_master.so';
root@MySQL-01 15:07:  [(none)]> INSTALL PLUGIN rpl_semi_sync_slave SONAME
'semisync_slave.so';
```

```
4

rpl_semi_sync_master_enabled=1
rpl_semi_sync_master_timeout=1000
rpl_semi_sync_slave_enabled=1
relay_log_purge=0
skip-name-resolve
#socket=/usr/mysql.sock
#auto_increment_offset = 2
#auto_increment_increment = 2
read_only=1
slave-skip-errors=1396
5
6 root@MySQL-01 15:07:  [(none)]> reset master;
7
mysql -uroot -p < /alidata/install/mysqlmasterall.sql
8
change master to
master_host='10.200.63.167',master_user='slave',master_password='abc123',M
ASTER_LOG_FILE='mybinlog.000023',MASTER_LOG_POS=274;
```

```
show variables like '%sync%';
```

安装配置MHA

管理节点manager和node节点都需要安装，数据库节点只需安装node节点即可

安装

```
mysqlmanager
rpm --import /etc/pki/rpm-gpg/*
rpm -ivh
http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-8.noarch.rpm
yum -y install perl-DBD-MySQL perl-Config-Tiny perl-Log-Dispatch
perl-Parallel-ForkManager perl-Config-IniFiles ncftp perl-Params-Validate
perl-CPAN perl-Test-Mock-LWP.noarch perl-LWP-Authen-Negotiate.noarch
perl-devel
yum install perl-ExtUtils-CBuilder perl-ExtUtils-MakeMaker


perlperl-devel perl-CPAN perl
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]#  perl Makefile.PL
*** Module::AutoInstall version 1.03
*** Checking for Perl dependencies...
[Core Features]
- DBI        ...loaded. (1.627)
- DBD::mysql ...loaded. (4.023)
*** Module::AutoInstall configuration finished.
Checking if your kit is complete...
Looks good
Writing Makefile for mha4mysql::node
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]#  make && make install
cp lib/MHA/BinlogManager.pm blib/lib/MHA/BinlogManager.pm
cp lib/MHA/BinlogPosFindManager.pm blib/lib/MHA/BinlogPosFindManager.pm
cp lib/MHA/BinlogPosFinderXid.pm blib/lib/MHA/BinlogPosFinderXid.pm
cp lib/MHA/BinlogHeaderParser.pm blib/lib/MHA/BinlogHeaderParser.pm
cp lib/MHA/BinlogPosFinder.pm blib/lib/MHA/BinlogPosFinder.pm
cp lib/MHA/NodeUtil.pm blib/lib/MHA/NodeUtil.pm
cp lib/MHA/BinlogPosFinderElp.pm blib/lib/MHA/BinlogPosFinderElp.pm
cp lib/MHA/SlaveUtil.pm blib/lib/MHA/SlaveUtil.pm
cp lib/MHA/NodeConst.pm blib/lib/MHA/NodeConst.pm
cp bin/filter_mysqlbinlog blib/script/filter_mysqlbinlog
/usr/bin/perl "-Iinc" -MExtUtils::MY -e 'MY->fixin(shift)' --
blib/script/filter_mysqlbinlog
cp bin/apply_diff_relay_logs blib/script/apply_diff_relay_logs
/usr/bin/perl "-Iinc" -MExtUtils::MY -e 'MY->fixin(shift)' --
blib/script/apply_diff_relay_logs
cp bin/purge_relay_logs blib/script/purge_relay_logs
/usr/bin/perl "-Iinc" -MExtUtils::MY -e 'MY->fixin(shift)' --
blib/script/purge_relay_logs
```

```
cp bin/save_binary_logs blib/script/save_binary_logs
/usr/bin/perl "-Iinc" -MExtUtils::MY -e 'MY->fixin(shift)' --
blib/script/save_binary_logs
Manifying blib/man1/filter_mysqlbinlog.1
Manifying blib/man1/apply_diff_relay_logs.1
Manifying blib/man1/purge_relay_logs.1
Manifying blib/man1/save_binary_logs.1
Installing /usr/local/share/perl5/MHA/BinlogManager.pm
Installing /usr/local/share/perl5/MHA/BinlogPosFinder.pm
Installing /usr/local/share/perl5/MHA/NodeConst.pm
Installing /usr/local/share/perl5/MHA/NodeUtil.pm
Installing /usr/local/share/perl5/MHA/BinlogPosFinderXid.pm
Installing /usr/local/share/perl5/MHA/SlaveUtil.pm
Installing /usr/local/share/perl5/MHA/BinlogPosFindManager.pm
Installing /usr/local/share/perl5/MHA/BinlogPosFinderElp.pm
Installing /usr/local/share/perl5/MHA/BinlogHeaderParser.pm
Installing /usr/local/share/man/man1/save_binary_logs.1
Installing /usr/local/share/man/man1/apply_diff_relay_logs.1
Installing /usr/local/share/man/man1/purge_relay_logs.1
Installing /usr/local/share/man/man1/filter_mysqlbinlog.1
Installing /usr/local/bin/apply_diff_relay_logs
Installing /usr/local/bin/purge_relay_logs
Installing /usr/local/bin/filter_mysqlbinlog
Installing /usr/local/bin/save_binary_logs
Appending installation info to /usr/lib64/perl5/perllocal.pod


[root@MANAGER src]# tar -xf mha4mysql-node-0.56.tar.gz
[root@MANAGER src]# cd mha4mysql-node-0.56
[root@MANAGER mha4mysql-node-0.56]# perl Makefile.PL
[root@MANAGER mha4mysql-node-0.56]# make && make install


manager

[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# tar -xf
mha4mysql-manager-0.56.tar.gz
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# cd
mha4mysql-manager-0.56
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# perl Makefile.PL
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# make && make install



[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# mkdir /etc/masterha
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# mkdir -p /masterha/app1
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# mkdir -p /scripts
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# cp samples/conf/*
```

```
/etc/masterha/
[root@iZzm08z1bbjy9xjgxy33taZ mha4mysql-node-0.56]# cp samples/scripts/*
/scripts
```

配置

```
root@iZzm0cl1fi1hbmgaxze2enZ masterha]# cat app1.cnf
[server default]
manager_workdir=/masterha/app1
manager_log=/masterha/app1/manager.log
user=mha_mon
password=123
ssh_user=root
repl_user=slave
repl_password=abc123
ping_interval=1
shutdown_script=""
master_ip_online_change_script=""
report_script=""

[server1]
hostname=10.200.63.167
master_binlog_dir=/alidata/mysql/log/
candidate_master=1

[server2]
hostname=10.200.63.169
master_binlog_dir=/alidata/mysql/log/
candidate_master=1

[server3]
hostname=10.200.63.170
master_binlog_dir=/alidata/mysql/log/
candidate_master=1
```

测试ssh

```
[root@iZzm08z1bbjy9xjgxy33taZ masterha]# masterha_check_ssh
--global_conf=/etc/masterha/masterha_default.cnf
--conf=/etc/masterha/app1.cnf
Thu Mar 14 15:32:05 2019 - [info] Reading default configuration from
/etc/masterha/masterha_default.cnf..
Thu Mar 14 15:32:05 2019 - [info] Reading application default configuration
from /etc/masterha/app1.cnf..
Thu Mar 14 15:32:05 2019 - [info] Reading server configuration from
/etc/masterha/app1.cnf..
Thu Mar 14 15:32:05 2019 - [info] Starting SSH connection tests..
Thu Mar 14 15:32:06 2019 - [debug]
Thu Mar 14 15:32:06 2019 - [debug]  Connecting via SSH from
root@10.200.63.169(10.200.63.169:22) to
root@10.200.63.167(10.200.63.167:22)..
Thu Mar 14 15:32:06 2019 - [debug]   ok.
Thu Mar 14 15:32:06 2019 - [debug]  Connecting via SSH from
root@10.200.63.169(10.200.63.169:22) to
root@10.200.63.170(10.200.63.170:22)..
Thu Mar 14 15:32:06 2019 - [debug]   ok.
Thu Mar 14 15:32:06 2019 - [debug]
Thu Mar 14 15:32:05 2019 - [debug]  Connecting via SSH from
root@10.200.63.167(10.200.63.167:22) to
root@10.200.63.169(10.200.63.169:22)..
Thu Mar 14 15:32:06 2019 - [debug]   ok.
Thu Mar 14 15:32:06 2019 - [debug]  Connecting via SSH from
root@10.200.63.167(10.200.63.167:22) to
root@10.200.63.170(10.200.63.170:22)..
Thu Mar 14 15:32:06 2019 - [debug]   ok.
Thu Mar 14 15:32:07 2019 - [debug]
Thu Mar 14 15:32:06 2019 - [debug]  Connecting via SSH from
root@10.200.63.170(10.200.63.170:22) to
root@10.200.63.167(10.200.63.167:22)..
Thu Mar 14 15:32:06 2019 - [debug]   ok.
Thu Mar 14 15:32:06 2019 - [debug]  Connecting via SSH from
root@10.200.63.170(10.200.63.170:22) to
root@10.200.63.169(10.200.63.169:22)..
Thu Mar 14 15:32:06 2019 - [debug]   ok.
Thu Mar 14 15:32:07 2019 - [info] All SSH connection tests passed
successfully.
```

测试mysql

```
mysql
[root@iZzm08z1bbjy9xjgxy33taZ masterha]#  ln -s /usr/local/mysql/bin/*
/usr/bin
```

```
[root@iZzm08z1bbjy9xjgxy33taZ masterha]# masterha_check_repl
--conf=/etc/masterha/app1.cnf
Thu Mar 14 15:46:44 2019 - [warning] Global configuration file
/etc/masterha_default.cnf not found. Skipping.
Thu Mar 14 15:46:44 2019 - [info] Reading application default configuration
from /etc/masterha/app1.cnf..
Thu Mar 14 15:46:44 2019 - [info] Reading server configuration from
/etc/masterha/app1.cnf..
Thu Mar 14 15:46:44 2019 - [info] MHA::MasterMonitor version 0.56.
Creating directory /masterha/app1.. done.
Thu Mar 14 15:46:45 2019 - [info] GTID failover mode = 1
Thu Mar 14 15:46:45 2019 - [info] Dead Servers:
Thu Mar 14 15:46:45 2019 - [info] Alive Servers:
Thu Mar 14 15:46:45 2019 - [info]   10.200.63.167(10.200.63.167:3306)
Thu Mar 14 15:46:45 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Thu Mar 14 15:46:45 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Thu Mar 14 15:46:45 2019 - [info] Alive Slaves:
Thu Mar 14 15:46:45 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Thu Mar 14 15:46:45 2019 - [info]     GTID ON
Thu Mar 14 15:46:45 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Thu Mar 14 15:46:45 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Thu Mar 14 15:46:45 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Thu Mar 14 15:46:45 2019 - [info]     GTID ON
Thu Mar 14 15:46:45 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Thu Mar 14 15:46:45 2019 - [info] Current Alive Master:
10.200.63.167(10.200.63.167:3306)
Thu Mar 14 15:46:45 2019 - [info] Checking slave configurations..
Thu Mar 14 15:46:45 2019 - [info] Checking replication filtering settings..
Thu Mar 14 15:46:45 2019 - [info]  binlog_do_db= , binlog_ignore_db=
Thu Mar 14 15:46:45 2019 - [info]  Replication filtering check ok.
Thu Mar 14 15:46:45 2019 - [info] GTID (with auto-pos) is supported.
Skipping all SSH and Node package checking.
Thu Mar 14 15:46:45 2019 - [info] Checking SSH publickey authentication
settings on the current master..
Thu Mar 14 15:46:45 2019 - [info] HealthCheck: SSH to 10.200.63.167 is
reachable.
Thu Mar 14 15:46:45 2019 - [info]
10.200.63.167(10.200.63.167:3306) (current master)
 +--10.200.63.169(10.200.63.169:3306)
 +--10.200.63.170(10.200.63.170:3306)

Thu Mar 14 15:46:45 2019 - [info] Checking replication health on
10.200.63.169..
Thu Mar 14 15:46:45 2019 - [info]  ok.
Thu Mar 14 15:46:45 2019 - [info] Checking replication health on
10.200.63.170..
Thu Mar 14 15:46:45 2019 - [info]  ok.
Thu Mar 14 15:46:45 2019 - [warning] master_ip_failover_script is not
```

```
defined.
Thu Mar 14 15:46:45 2019 - [warning] shutdown_script is not defined.
Thu Mar 14 15:46:45 2019 - [info] Got exit code 0 (Not master dead).

MySQL Replication Health is OK.
```

至此，MHA已经配置完毕

启动manager

```
[root@iZzm0cl1fi1hbmgaxze2enZ masterha]# nohup masterha_manager
--conf=/etc/masterha/app1.cnf > /tmp/mha_manager.log < /dev/null 2>&1 &
```

测试故障

```
#
#
[root@iZzm08z1bbjy9xjgxy33taZ app1]# tail -f manager.log
10.200.63.167(10.200.63.167:3306) (current master)
 +--10.200.63.169(10.200.63.169:3306)
 +--10.200.63.170(10.200.63.170:3306)

Thu Mar 14 15:56:15 2019 - [warning] master_ip_failover_script is not
defined.
Thu Mar 14 15:56:15 2019 - [warning] shutdown_script is not defined.
Thu Mar 14 15:56:15 2019 - [info] Set master ping interval 1 seconds.
Thu Mar 14 15:56:15 2019 - [warning] secondary_check_script is not defined.
It is highly recommended setting it to check master reachability from two
or more routes.
Thu Mar 14 15:56:15 2019 - [info] Starting ping health check on
10.200.63.167(10.200.63.167:3306)..
Thu Mar 14 15:56:15 2019 - [info] Ping(SELECT) succeeded, waiting until
MySQL doesn't respond..

10.200.63.167
10.200.63.16910.200.63.170


#
[root@iZzm09r762s7xsf4lg87fhZ mha4mysql-node-0.56]# /etc/init.d/mysqld stop
Shutting down MySQL.....                                   [  OK  ]

#
Fri Mar 15 14:02:18 2019 - [warning] Got error on MySQL select ping: 2006
(MySQL server has gone away)
Fri Mar 15 14:02:18 2019 - [info] Executing SSH check script: exit 0
Fri Mar 15 14:02:19 2019 - [info] HealthCheck: SSH to 10.200.63.167 is
reachable.
Fri Mar 15 14:02:19 2019 - [warning] Got error on MySQL connect: 2003
(Can't connect to MySQL server on '10.200.63.167' (111))
Fri Mar 15 14:02:19 2019 - [warning] Connection failed 2 time(s)..
```

```
Fri Mar 15 14:02:20 2019 - [warning] Got error on MySQL connect: 2003
(Can't connect to MySQL server on '10.200.63.167' (111))
Fri Mar 15 14:02:20 2019 - [warning] Connection failed 3 time(s)..
Fri Mar 15 14:02:21 2019 - [warning] Got error on MySQL connect: 2003
(Can't connect to MySQL server on '10.200.63.167' (111))
Fri Mar 15 14:02:21 2019 - [warning] Connection failed 4 time(s)..
Fri Mar 15 14:02:21 2019 - [warning] Master is not reachable from health
checker!
Fri Mar 15 14:02:21 2019 - [warning] Master
10.200.63.167(10.200.63.167:3306) is not reachable!
Fri Mar 15 14:02:21 2019 - [warning] SSH is reachable.
Fri Mar 15 14:02:21 2019 - [info] Connecting to a master server failed.
Reading configuration file /etc/masterha_default.cnf and
/etc/masterha/app1.cnf again, and trying to connect to all servers to check
server status..
Fri Mar 15 14:02:21 2019 - [warning] Global configuration file
/etc/masterha_default.cnf not found. Skipping.
Fri Mar 15 14:02:21 2019 - [info] Reading application default configuration
from /etc/masterha/app1.cnf..
Fri Mar 15 14:02:21 2019 - [info] Reading server configuration from
/etc/masterha/app1.cnf..
Fri Mar 15 14:02:22 2019 - [info] GTID failover mode = 1
Fri Mar 15 14:02:22 2019 - [info] Dead Servers:
Fri Mar 15 14:02:22 2019 - [info]   10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:22 2019 - [info] Alive Servers:
Fri Mar 15 14:02:22 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Fri Mar 15 14:02:22 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Fri Mar 15 14:02:22 2019 - [info] Alive Slaves:
Fri Mar 15 14:02:22 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:22 2019 - [info]     GTID ON
Fri Mar 15 14:02:22 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:22 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:22 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:22 2019 - [info]     GTID ON
Fri Mar 15 14:02:22 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:22 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:22 2019 - [info] Checking slave configurations..
Fri Mar 15 14:02:22 2019 - [info] Checking replication filtering settings..
Fri Mar 15 14:02:22 2019 - [info]  Replication filtering check ok.
Fri Mar 15 14:02:22 2019 - [info] Master is down!
Fri Mar 15 14:02:22 2019 - [info] Terminating monitoring script.
Fri Mar 15 14:02:22 2019 - [info] Got exit code 20 (Master dead).
Fri Mar 15 14:02:23 2019 - [info] MHA::MasterFailover version 0.56.
Fri Mar 15 14:02:23 2019 - [info] Starting master failover.
Fri Mar 15 14:02:23 2019 - [info]
Fri Mar 15 14:02:23 2019 - [info] * Phase 1: Configuration Check Phase..
Fri Mar 15 14:02:23 2019 - [info]
```

```
Fri Mar 15 14:02:24 2019 - [info] GTID failover mode = 1
Fri Mar 15 14:02:24 2019 - [info] Dead Servers:
Fri Mar 15 14:02:24 2019 - [info]   10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:24 2019 - [info] Checking master reachability via
MySQL(double check)...
Fri Mar 15 14:02:24 2019 - [info]  ok.
Fri Mar 15 14:02:24 2019 - [info] Alive Servers:
Fri Mar 15 14:02:24 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Fri Mar 15 14:02:24 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Fri Mar 15 14:02:24 2019 - [info] Alive Slaves:
Fri Mar 15 14:02:24 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:24 2019 - [info]     GTID ON
Fri Mar 15 14:02:24 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:24 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:24 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:24 2019 - [info]     GTID ON
Fri Mar 15 14:02:24 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:24 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:24 2019 - [info] Starting GTID based failover.
Fri Mar 15 14:02:24 2019 - [info]
Fri Mar 15 14:02:24 2019 - [info] ** Phase 1: Configuration Check Phase
completed.
Fri Mar 15 14:02:24 2019 - [info]
Fri Mar 15 14:02:24 2019 - [info] * Phase 2: Dead Master Shutdown Phase..
Fri Mar 15 14:02:24 2019 - [info]
Fri Mar 15 14:02:24 2019 - [info] Forcing shutdown so that applications
never connect to the current master..
Fri Mar 15 14:02:24 2019 - [warning] master_ip_failover_script is not set.
Skipping invalidating dead master IP address.
Fri Mar 15 14:02:24 2019 - [warning] shutdown_script is not set. Skipping
explicit shutting down of the dead master.
Fri Mar 15 14:02:25 2019 - [info] * Phase 2: Dead Master Shutdown Phase
completed.
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] * Phase 3: Master Recovery Phase..
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] * Phase 3.1: Getting Latest Slaves
Phase..
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] The latest binary log file/position on
all slaves is mybinlog.000019:941
Fri Mar 15 14:02:25 2019 - [info] Retrieved Gtid Set:
48c10a24-3fbe-11e9-81ef-00163e000619:633-635
Fri Mar 15 14:02:25 2019 - [info] Latest slaves (Slaves that received relay
log files to the latest):
Fri Mar 15 14:02:25 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
```

```
Fri Mar 15 14:02:25 2019 - [info]     GTID ON
Fri Mar 15 14:02:25 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:25 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:25 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:25 2019 - [info]     GTID ON
Fri Mar 15 14:02:25 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:25 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:25 2019 - [info] The oldest binary log file/position on
all slaves is mybinlog.000019:941
Fri Mar 15 14:02:25 2019 - [info] Retrieved Gtid Set:
48c10a24-3fbe-11e9-81ef-00163e000619:633-635
Fri Mar 15 14:02:25 2019 - [info] Oldest slaves:
Fri Mar 15 14:02:25 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:25 2019 - [info]     GTID ON
Fri Mar 15 14:02:25 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:25 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:25 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:25 2019 - [info]     GTID ON
Fri Mar 15 14:02:25 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:25 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] * Phase 3.3: Determining New Master
Phase..
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] Searching new master from slaves..
Fri Mar 15 14:02:25 2019 - [info]  Candidate masters from the configuration
file:
Fri Mar 15 14:02:25 2019 - [info]   10.200.63.169(10.200.63.169:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:25 2019 - [info]     GTID ON
Fri Mar 15 14:02:25 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:25 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:25 2019 - [info]   10.200.63.170(10.200.63.170:3306)
Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
Fri Mar 15 14:02:25 2019 - [info]     GTID ON
Fri Mar 15 14:02:25 2019 - [info]     Replicating from
10.200.63.167(10.200.63.167:3306)
Fri Mar 15 14:02:25 2019 - [info]     Primary candidate for the new Master
(candidate_master is set)
Fri Mar 15 14:02:25 2019 - [info]  Non-candidate masters:
```

```
Fri Mar 15 14:02:25 2019 - [info]  Searching from candidate_master slaves
which have received the latest relay log events..
Fri Mar 15 14:02:25 2019 - [info] New master is
10.200.63.169(10.200.63.169:3306)
Fri Mar 15 14:02:25 2019 - [info] Starting master failover..
Fri Mar 15 14:02:25 2019 - [info]
From:
10.200.63.167(10.200.63.167:3306) (current master)
 +--10.200.63.169(10.200.63.169:3306)
 +--10.200.63.170(10.200.63.170:3306)

To:
10.200.63.169(10.200.63.169:3306) (new master)
 +--10.200.63.170(10.200.63.170:3306)
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] * Phase 3.3: New Master Recovery Phase..
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info]  Waiting all logs to be applied..
Fri Mar 15 14:02:25 2019 - [info]   done.
Fri Mar 15 14:02:25 2019 - [info] Getting new master's binlog name and
position..
Fri Mar 15 14:02:25 2019 - [info]  mybinlog.000007:767482
Fri Mar 15 14:02:25 2019 - [info]  All other slaves should start
replication from here. Statement should be: CHANGE MASTER TO
MASTER_HOST='10.200.63.169', MASTER_PORT=3306, MASTER_AUTO_POSITION=1,
MASTER_USER='slave', MASTER_PASSWORD='xxx';
Fri Mar 15 14:02:25 2019 - [info] Master Recovery succeeded.
File:Pos:Exec_Gtid_Set: mybinlog.000007, 767482,
48c10a24-3fbe-11e9-81ef-00163e000619:621-628:633-635,
75746631-46d4-11e9-928d-00163e000af9:1-157,
b6ee2241-4607-11e9-bbc6-00163e000af9:1-170
Fri Mar 15 14:02:25 2019 - [warning] master_ip_failover_script is not set.
Skipping taking over new master IP address.
Fri Mar 15 14:02:25 2019 - [info] Setting read_only=0 on
10.200.63.169(10.200.63.169:3306)..
Fri Mar 15 14:02:25 2019 - [info]  ok.
Fri Mar 15 14:02:25 2019 - [info] ** Finished master recovery successfully.
Fri Mar 15 14:02:25 2019 - [info] * Phase 3: Master Recovery Phase
completed.
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] * Phase 4: Slaves Recovery Phase..
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] * Phase 4.1: Starting Slaves in
parallel..
Fri Mar 15 14:02:25 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info] -- Slave recovery on host
10.200.63.170(10.200.63.170:3306) started, pid: 23124. Check tmp log
/masterha/app1/10.200.63.170_3306_20190315140222.log if it takes time..
Fri Mar 15 14:02:27 2019 - [info]
Fri Mar 15 14:02:27 2019 - [info] Log messages from 10.200.63.170 ...
Fri Mar 15 14:02:27 2019 - [info]
Fri Mar 15 14:02:25 2019 - [info]  Resetting slave
```

```
10.200.63.170(10.200.63.170:3306) and starting replication from the new
master 10.200.63.169(10.200.63.169:3306)..
Fri Mar 15 14:02:25 2019 - [info]  Executed CHANGE MASTER.
Fri Mar 15 14:02:25 2019 - [info]  Slave started.
Fri Mar 15 14:02:26 2019 - [info]
gtid_wait(48c10a24-3fbe-11e9-81ef-00163e000619:621-628:633-635,
75746631-46d4-11e9-928d-00163e000af9:1-157,
b6ee2241-4607-11e9-bbc6-00163e000af9:1-170) completed on
10.200.63.170(10.200.63.170:3306). Executed 162 events.
Fri Mar 15 14:02:27 2019 - [info] End of log messages from 10.200.63.170.
Fri Mar 15 14:02:27 2019 - [info] -- Slave on host
10.200.63.170(10.200.63.170:3306) started.
Fri Mar 15 14:02:27 2019 - [info] All new slave servers recovered
successfully.
Fri Mar 15 14:02:27 2019 - [info]
Fri Mar 15 14:02:27 2019 - [info] * Phase 5: New master cleanup phase..
Fri Mar 15 14:02:27 2019 - [info]
Fri Mar 15 14:02:27 2019 - [info] Resetting slave info on the new master..
Fri Mar 15 14:02:27 2019 - [info]  10.200.63.169: Resetting slave info
succeeded.
Fri Mar 15 14:02:27 2019 - [info] Master failover to
10.200.63.169(10.200.63.169:3306) completed successfully.
Fri Mar 15 14:02:27 2019 - [info]

----- Failover Report -----

app1: MySQL Master failover 10.200.63.167(10.200.63.167:3306) to
10.200.63.169(10.200.63.169:3306) succeeded

Master 10.200.63.167(10.200.63.167:3306) is down!


Check MHA Manager logs at
iZzm0cl1fi1hbmgaxze2enZ:/masterha/app1/manager.log for details.

Started automated(non-interactive) failover.
Selected 10.200.63.169(10.200.63.169:3306) as a new master.
10.200.63.169(10.200.63.169:3306): OK: Applying all logs succeeded.
10.200.63.170(10.200.63.170:3306): ERROR: Failed on waiting gtid exec set
on master.
Master failover to 10.200.63.169(10.200.63.169:3306) done, but recovery on
slave partially failed.



10.200.63.169down10.200.63.170169


#
slave110.200.63.169
root@MySQL-01 15:03:  [(none)]> show slave status\G;
*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event
```

```
                  Master_Host: 10.200.63.167
                  Master_User: slave
                  Master_Port: 3306
                Connect_Retry: 60
              Master_Log_File: mybinlog.000024
          Read_Master_Log_Pos: 1262
               Relay_Log_File: iZzm0hxkefxmcs7g22mg3mZ-relay-bin.000003
                Relay_Log_Pos: 1353
        Relay_Master_Log_File: mybinlog.000024
             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: 1262
              Relay_Log_Space: 1968
              Until_Condition: None
               Until_Log_File:
                Until_Log_Pos: 0
           Master_SSL_Allowed: No
           Master_SSL_CA_File:
           Master_SSL_CA_Path:
              Master_SSL_Cert:
            Master_SSL_Cipher:
               Master_SSL_Key:
        Seconds_Behind_Master: 0
Master_SSL_Verify_Server_Cert: No
                Last_IO_Errno: 0
                Last_IO_Error:
               Last_SQL_Errno: 0
               Last_SQL_Error:
  Replicate_Ignore_Server_Ids:
             Master_Server_Id: 2
                  Master_UUID: 48c10a24-3fbe-11e9-81ef-00163e000619
             Master_Info_File: mysql.slave_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: 48c10a24-3fbe-11e9-81ef-00163e000619:639-641
             Executed_Gtid_Set:
```

```
48c10a24-3fbe-11e9-81ef-00163e000619:639-641,
eb66648c-46ee-11e9-b21a-00163e000af9:1-155
                Auto_Position: 0
         Replicate_Rewrite_DB:
                 Channel_Name:
           Master_TLS_Version:
1 row in set (0.00 sec)

ERROR:
No query specified

slave210.200.63.170
root@MySQL-01 15:03:  [(none)]> show slave status\G;
*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event
                  Master_Host: 10.200.63.167
                  Master_User: slave
                  Master_Port: 3306
                Connect_Retry: 60
              Master_Log_File: mybinlog.000024
          Read_Master_Log_Pos: 1262
               Relay_Log_File: iZzm07add25vlwa21nb9iqZ-relay-bin.000003
                Relay_Log_Pos: 1353
        Relay_Master_Log_File: mybinlog.000024
             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: 1262
              Relay_Log_Space: 1968
              Until_Condition: None
               Until_Log_File:
                Until_Log_Pos: 0
           Master_SSL_Allowed: No
           Master_SSL_CA_File:
           Master_SSL_CA_Path:
              Master_SSL_Cert:
            Master_SSL_Cipher:
               Master_SSL_Key:
        Seconds_Behind_Master: 0
Master_SSL_Verify_Server_Cert: No
                Last_IO_Errno: 0
                Last_IO_Error:
               Last_SQL_Errno: 0
               Last_SQL_Error:
  Replicate_Ignore_Server_Ids:
```

```
             Master_Server_Id: 2
                  Master_UUID: 48c10a24-3fbe-11e9-81ef-00163e000619
             Master_Info_File: mysql.slave_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: 48c10a24-3fbe-11e9-81ef-00163e000619:639-641
            Executed_Gtid_Set:
48c10a24-3fbe-11e9-81ef-00163e000619:639-641,
fbf1f47e-46ed-11e9-9b90-00163e001b31:1-155
                Auto_Position: 0
         Replicate_Rewrite_DB:
                 Channel_Name:
           Master_TLS_Version:
1 row in set (0.00 sec)

ERROR:
No query specified


# 10.200.63.167 10.200.63.16910.200.63.170


root@MySQL-01 11:59:  [chuchu]> show slave status\G;
ERROR 2006 (HY000): MySQL server has gone away
No connection. Trying to reconnect...
Connection id:    38
Current database: chuchu

*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event
                  Master_Host: 10.200.63.169
                  Master_User: slave
                  Master_Port: 3306
                Connect_Retry: 60
              Master_Log_File: mybinlog.000007
          Read_Master_Log_Pos: 767482
               Relay_Log_File: iZzm07add25vlwa21nb9iqZ-relay-bin.000006
                Relay_Log_Pos: 767003
        Relay_Master_Log_File: mybinlog.000007
             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: 767482
              Relay_Log_Space: 770334
              Until_Condition: None
               Until_Log_File:
                Until_Log_Pos: 0
           Master_SSL_Allowed: No
           Master_SSL_CA_File:
           Master_SSL_CA_Path:
              Master_SSL_Cert:
            Master_SSL_Cipher:
               Master_SSL_Key:
        Seconds_Behind_Master: 0
Master_SSL_Verify_Server_Cert: No
                Last_IO_Errno: 0
                Last_IO_Error:
               Last_SQL_Errno: 0
               Last_SQL_Error:
  Replicate_Ignore_Server_Ids:
             Master_Server_Id: 1
                  Master_UUID: 75746631-46d4-11e9-928d-00163e000af9
             Master_Info_File: mysql.slave_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: 75746631-46d4-11e9-928d-00163e000af9:1-157,
b6ee2241-4607-11e9-bbc6-00163e000af9:167-170
            Executed_Gtid_Set:
48c10a24-3fbe-11e9-81ef-00163e000619:621-628:633-635,
75746631-46d4-11e9-928d-00163e000af9:1-157,
7e80f179-4613-11e9-8d4f-00163e001b31:1-320,
b6ee2241-4607-11e9-bbc6-00163e000af9:1-170,
e7092863-46d2-11e9-b14a-00163e001b31:1-157
                Auto_Position: 1
         Replicate_Rewrite_DB:
                 Channel_Name:
           Master_TLS_Version:
1 row in set (0.00 sec)

ERROR:
No query specified
```

```
10.200.63.169
```

重构测试

目前 10.200.63.167已经故障，10.100.63.169
已经成为新的主，重构的话可以重新搭建10.100.63.167，并使之作为10.100.63.169的从，也可以拿出一台新的服务器作为从库并添加到配置文件中，我使用的是重新修复10.100.63.167，使之作为10.100.63.169的从库

```
1 mmanager
masterha_stop --conf=/etc/masterha/app1.cnf
2 10.100.63.167 10.100.63.169
3 mysql
 masterha_check_repl --conf=/etc/masterha/app1.cnf
4 manager
app1.failover.complete
[root@iZzm0cl1fi1hbmgaxze2enZ masterha]#  rm -rf app1.failover.complete
nohup masterha_manager --conf=/etc/masterha/app1.cnf > /tmp/mha_manager.log
&1 &
5 10.100.63.167
 root@MySQL-01 15:11:  [(none)]> show slave status\G;
*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event
                  Master_Host: 10.200.63.169
                  Master_User: slave
                  Master_Port: 3306
                Connect_Retry: 60
              Master_Log_File: mybinlog.000001
          Read_Master_Log_Pos: 767399
               Relay_Log_File: iZzm09r762s7xsf4lg87fhZ-relay-bin.000002
                Relay_Log_Pos: 766678
        Relay_Master_Log_File: mybinlog.000001
             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: 767399
              Relay_Log_Space: 766983
              Until_Condition: None
               Until_Log_File:
                Until_Log_Pos: 0
           Master_SSL_Allowed: No
           Master_SSL_CA_File:
```

```
           Master_SSL_CA_Path:
              Master_SSL_Cert:
            Master_SSL_Cipher:
               Master_SSL_Key:
        Seconds_Behind_Master: 0
Master_SSL_Verify_Server_Cert: No
                Last_IO_Errno: 0
                Last_IO_Error:
               Last_SQL_Errno: 0
               Last_SQL_Error:
  Replicate_Ignore_Server_Ids:
             Master_Server_Id: 1
                  Master_UUID: eb66648c-46ee-11e9-b21a-00163e000af9
             Master_Info_File: mysql.slave_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: eb66648c-46ee-11e9-b21a-00163e000af9:1-155
            Executed_Gtid_Set: 48c10a24-3fbe-11e9-81ef-00163e000619:1-641,
54e9bfaa-3fbe-11e9-b907-00163e0019b5:1-274,
b6ee2241-4607-11e9-bbc6-00163e000af9:1-166,
eb66648c-46ee-11e9-b21a-00163e000af9:1-155
                Auto_Position: 1
         Replicate_Rewrite_DB:
                 Channel_Name:
           Master_TLS_Version:
1 row in set (0.00 sec)

ERROR:
No query specified



10.200.63.169(10.200.63.169:3306) (current master)
 +--10.200.63.167(10.200.63.167:3306)
 +--10.200.63.170(10.200.63.170:3306)

Fri Mar 15 15:13:14 2019 - [warning] master_ip_failover_script is not
defined.
Fri Mar 15 15:13:14 2019 - [warning] shutdown_script is not defined.
Fri Mar 15 15:13:14 2019 - [info] Set master ping interval 1 seconds.
Fri Mar 15 15:13:14 2019 - [warning] secondary_check_script is not defined.
It is highly recommended setting it to check master reachability from two
or more routes.
Fri Mar 15 15:13:14 2019 - [info] Starting ping health check on
```

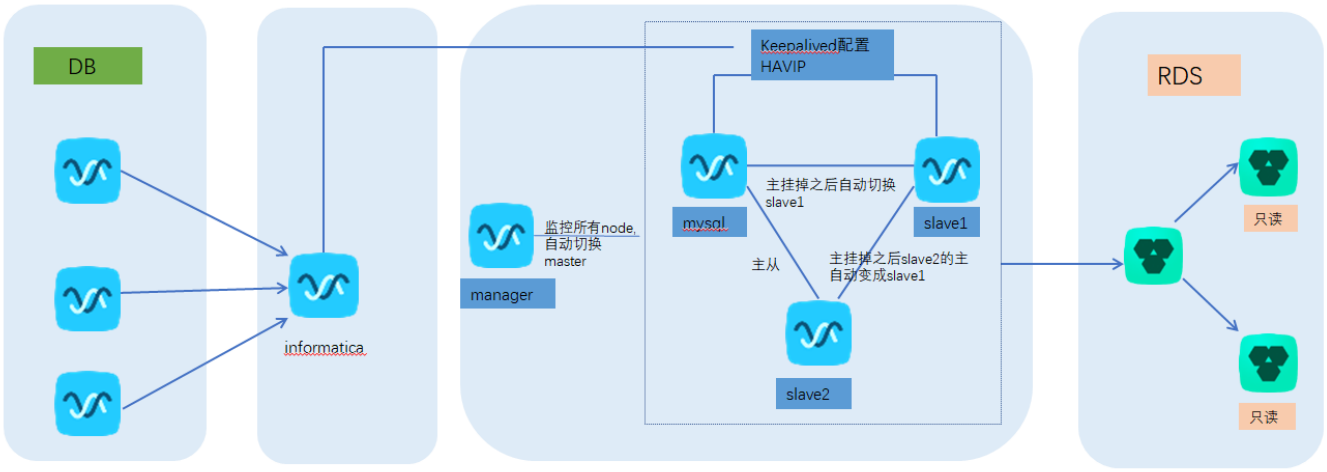
```
10.200.63.169(10.200.63.169:3306)..
Fri Mar 15 15:13:14 2019 - [info] Ping(SELECT) succeeded, waiting until
MySQL doesn't respond..
```

验证结果

keepalived 搭建

环境

准备一个HAVIP，私网：10.200.63.1，绑定两个ECS实例，10.200.63.167和10.200.63.169



安装

安装

yum -y install keepalived

配置

```
vip10.200.63.1


10.200.63.16910.200.63.167
# 10.200.63.169
/etc/keepalived/keepalived.conf 10.200.63.169 state MASTER
! Configuration File for keepalived

global_defs {
   notification_email {
     acassen@firewall.loc
     failover@firewall.loc
     sysadmin@firewall.loc
   }
   notification_email_from Alexandre.Cassen@firewall.loc
   smtp_server 10.200.63.169
   smtp_connect_timeout 30
   router_id LVS_DEVEL
}

vrrp_instance VI_1 {
    state MASTER
    interface eth0
    virtual_router_id 51
    priority 100
    advert_int 1
    authentication {
        auth_type PASS
        auth_pass 1111
    }
    virtual_ipaddress {
        10.200.63.1 dev eth0 label eth0:havip
    }
    unicast_src_ip 10.200.63.169
    unicast_peer {
            10.200.63.167
                 }
}




# 10.200.63.167
/etc/keepalived/keepalived.conf state BACKUP
! Configuration File for keepalived

global_defs {
   notification_email {
     acassen@firewall.loc
     failover@firewall.loc
```

```
      sysadmin@firewall.loc
   }
   notification_email_from Alexandre.Cassen@firewall.loc
   smtp_server 10.200.63.169
   smtp_connect_timeout 30
   router_id LVS_DEVEL
}

vrrp_instance VI_1 {
    state BACKUP
    interface eth0
    virtual_router_id 51
    priority 50
    advert_int 1
    authentication {
        auth_type PASS
        auth_pass 1111
    }
    virtual_ipaddress {
        10.200.63.1 dev eth0 label eth0:havip
    }
#    notify_master /etc/keepalived/scripts/ha_vip_start.sh
#    notify_backup /etc/keepalived/scripts/ha_vip_stop.sh
#    notify_fault /etc/keepalived/scripts/ha_vip_stop.sh
#    notify_stop /etc/keepalived/scripts/ha_vip_stop.sh
    unicast_src_ip 10.200.63.167
    unicast_peer {
```

```
            10.200.63.169
                }
}
```

启动keepalived

systemctl start keepalived

验证结果

查看网卡信息

```
[root@iZzm0hxkefxmcs7g22mg3mZ ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP qlen 1000
    link/ether 00:16:3e:00:0a:f9 brd ff:ff:ff:ff:ff:ff
    inet 10.200.63.169/23 brd 10.200.63.255 scope global dynamic eth0
       valid_lft 315016557sec preferred_lft 315016557sec
    inet 10.200.63.1/32 scope global eth0:havip
       valid_lft forever preferred_lft forever



[root@iZzm09r762s7xsf4lg87fhZ ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP qlen 1000
    link/ether 00:16:3e:00:06:19 brd ff:ff:ff:ff:ff:ff
    inet 10.200.63.167/23 brd 10.200.63.255 scope global dynamic eth0
       valid_lft 314320737sec preferred_lft 314320737sec
```

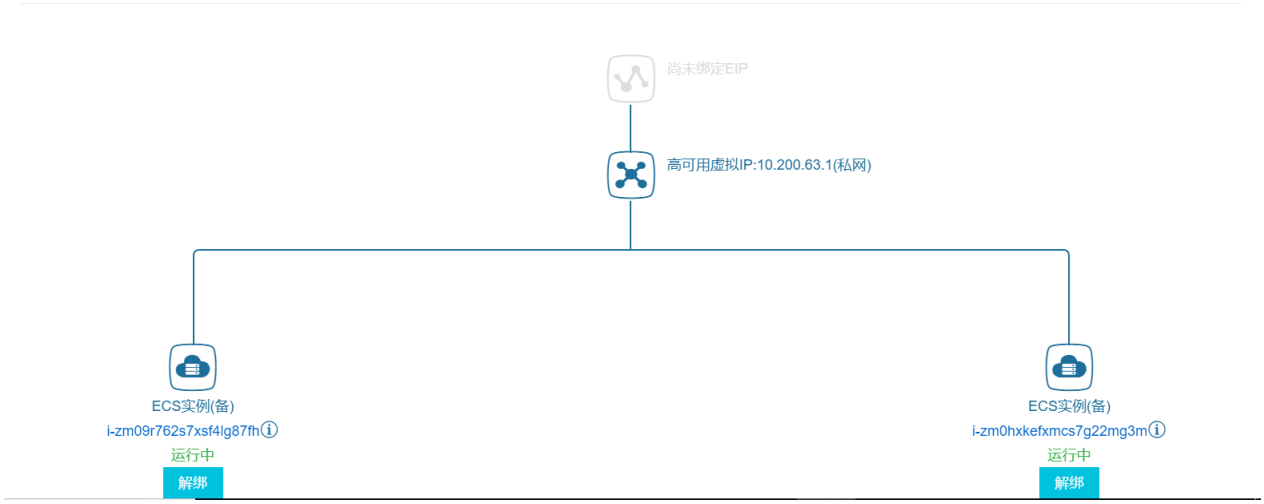
VIP已经绑定在10.200.63169

访问VIP

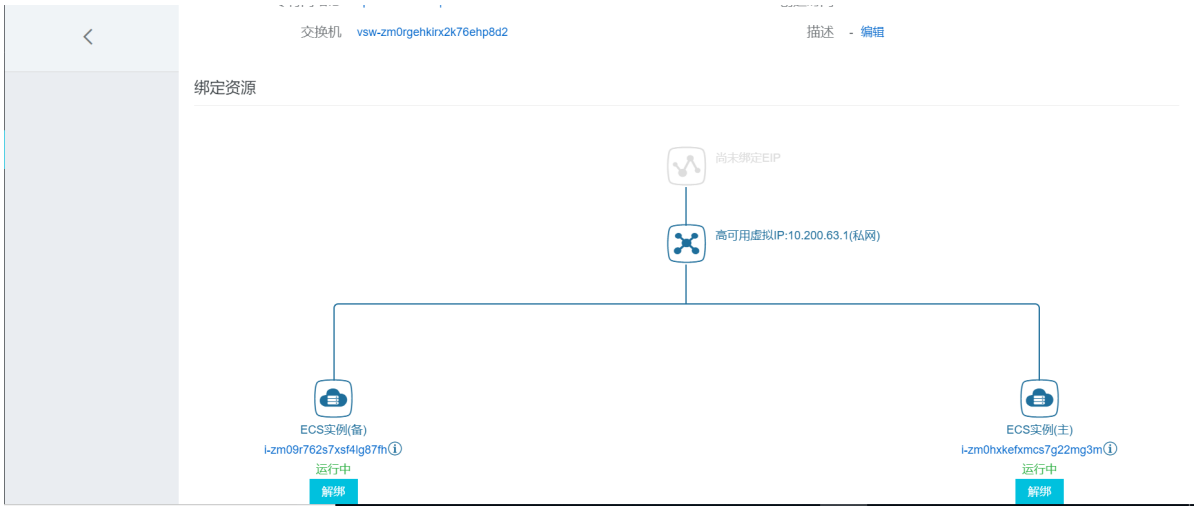
```
[root@iZzm0cl1fi1hbmgaxze2enZ ~]# mysql -umha_mon -p123 -h10.200.63.1
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 49
Server version: 5.7.17-log MySQL Community Server (GPL)

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

MySQL [(none)]>
```

查看HAVIP控制台

1 未启动keepalived之前，HAVIP控制台显示两台ECS都是备



2 开启keepalived后，VIP已经绑定在10.200.63169 ，HAVIP控制天显示10.200.63.169为主



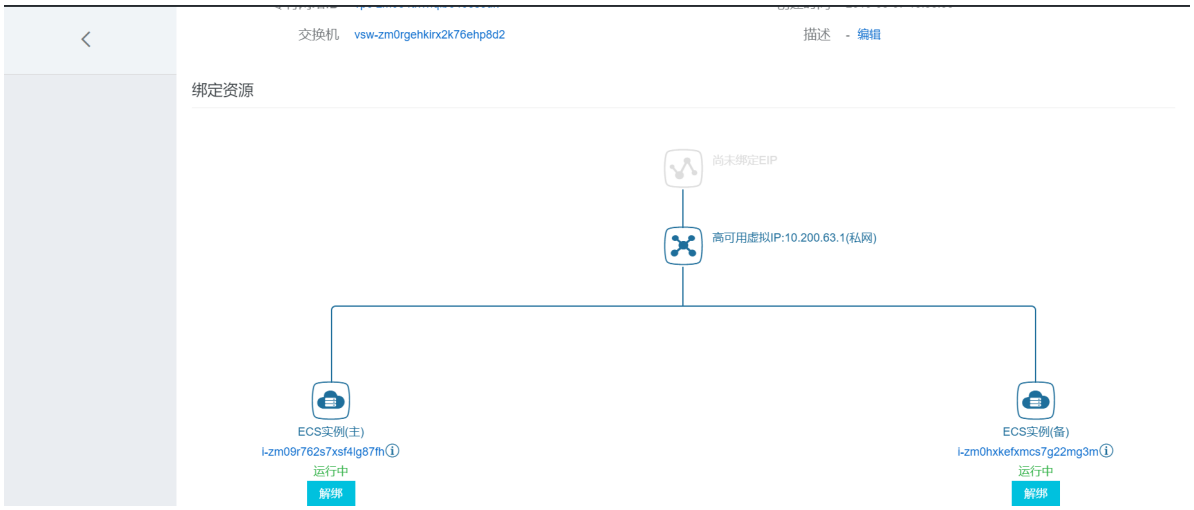
模拟主故障

停止10.200.63.169 的kepalived

可以看到VIP 已经绑定到 10.200.63.167

```
[root@iZzm0hxkefxmcs7g22mg3mZ ~]# systemctl stop keepalived
[root@iZzm0hxkefxmcs7g22mg3mZ ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP qlen 1000
    link/ether 00:16:3e:00:0a:f9 brd ff:ff:ff:ff:ff:ff
    inet 10.200.63.169/23 brd 10.200.63.255 scope global dynamic eth0
       valid_lft 315015986sec preferred_lft 315015986sec


[root@iZzm09r762s7xsf4lg87fhZ ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP qlen 1000
    link/ether 00:16:3e:00:06:19 brd ff:ff:ff:ff:ff:ff
    inet 10.200.63.167/23 brd 10.200.63.255 scope global dynamic eth0
       valid_lft 314320194sec preferred_lft 314320194sec
    inet 10.200.63.1/32 scope global eth0:havip
       valid_lft forever preferred_lft forever
```

HAVIP 控制台显示 10.200.63.167 为主



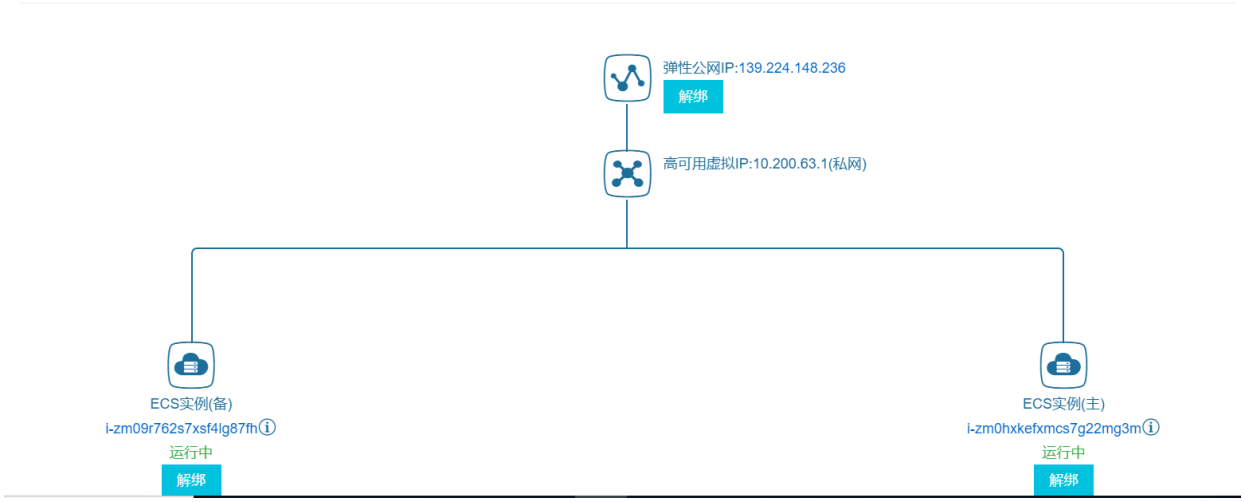
总结

配置过程中注意的点

```
1 MHA
2 manager
3 manager app1.failover.complete
```

DTS同步

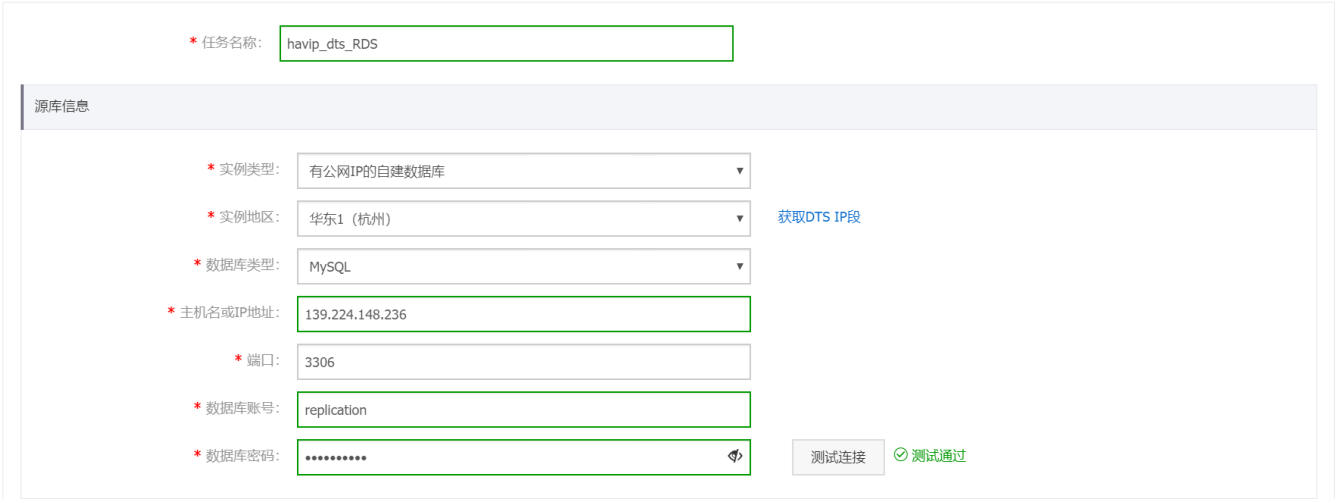
源实例

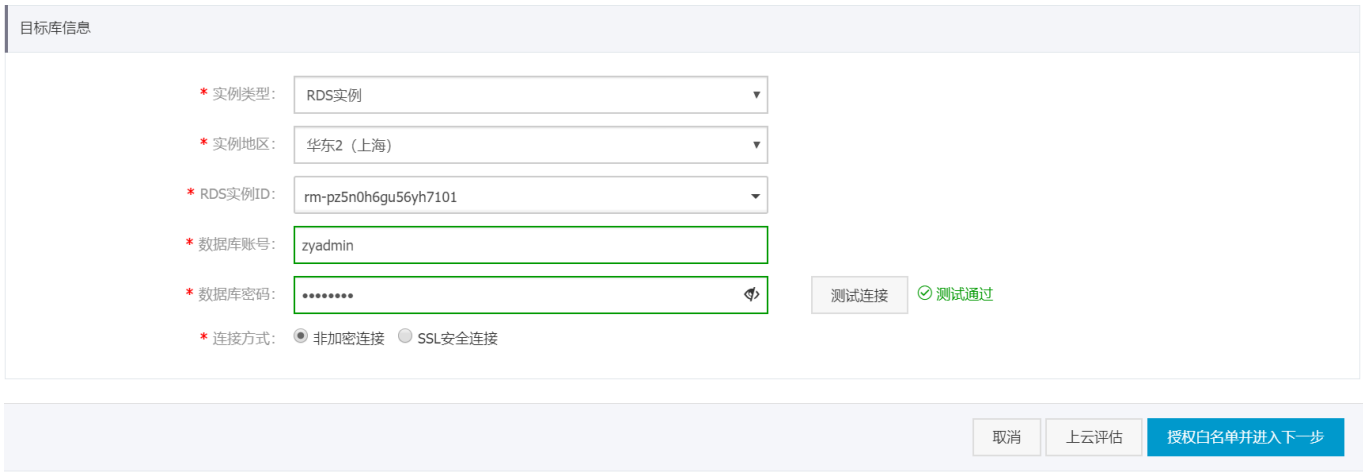


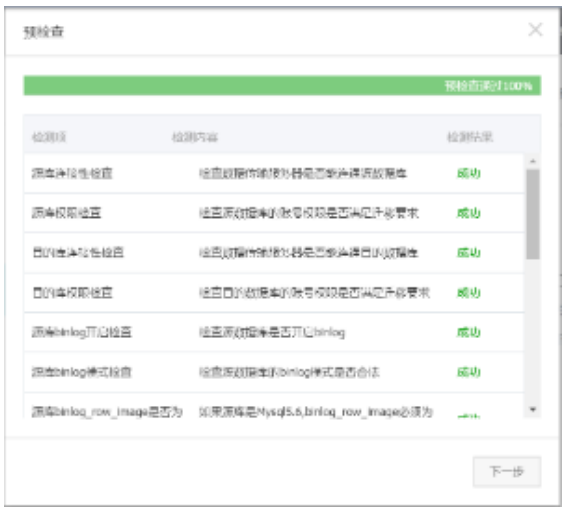
HAVIP：139.224.148.236

目标实例

DTS配置步骤




目标库信息
* 实例类型: RDS实例
* 实例地区: 华东2（上海）
* RDS实例ID: rm-pz5n0h6gu56yh7101
* 数据库账号: zyadmin
* 数据库密码: ••••••••
测试连接
测试通过
* 连接方式: 非加密连接 SSL安全连接
取消
上云评估
授权白名单并进入下一步


预检查
下一步


ID/名称: dtsvb6dktnh780y / havip_dts_RDS
状态: 迁移中
暂停任务
查看详情
创建类似任务
升级
监控报警
2019-04-12 15:01:47 创建
完成
结构迁移 100%
全量迁移 100%(已迁移0行)
增量迁移 无延迟

验证

在主实例上创建表

```
root@MySQL-01 15:05:  [chuchu]> create table list11(id int);
ERROR 2006 (HY000): MySQL server has gone away
No connection. Trying to reconnect...
Connection id:    37
Current database: chuchu

Query OK, 0 rows affected (0.03 sec)
root@MySQL-01 15:25:  [chuchu]> show tables;
+------------------+
| Tables_in_chuchu |
+------------------+
| list10           |
| list11           |
| list2            |
| list6            |
| list8            |
| list9            |
+------------------+
6 rows in set (0.00 sec)
```

查看RDS

已经同步

日常维护命令

```
1 ssh
masterha_check_ssh --conf=/etc/masterha/app1.cnf
2
masterha_check_repl --conf=/etc/masterha/app1.cnf
3
nohup masterha_manager --conf=/etc/masterha/app1.cnf > /tmp/mha_manager.log
< /dev/null 2>&1 &
4
masterha_check_status --conf=/etc/masterha/app1.cnf
5
masterha_stop --conf=/etc/masterha/app1.cnf
```