ANE-MySQL+MHA 实现

高可用配置 SOP

上海安能聚创供应链管理有限公司

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文档信息

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三．前言

1.文档简介

　　该文档详细描述了 MHA 高可用的搭建过程，以及最后的测试结果，此文档为标准作业化文档，供日后查阅和适用。

2.适用环境

　　本文档适用于所有安装 MHA 架构的数据库服务器。

四．MHA 安装步骤

1.环境

系统	Linux CentOS 6.8
MySQL 版本	Percona MySQL 5.6.35
MHA manager	mha4mysql-manager-0.56
MHA node	mha4mysql-node-0.56
系统用户	root
172.168.101.191	MASTER
172.168.101.195	STANDBY-MASTER
172.168.101.193	SLAVE
172.168.101.194	Manager

2.安装 MySQL

见文档 ANE-MySQL 数据库安装配置文档 SOP。

3.配置 MySQL 半同步

见文档 ANE-MySQL 数据库半同步配置文档 SOP。

4.MHA 安装及配置

4.1 设置 4 台服务器 ssh 免密码登录

所有服务器上执行生成本机公钥
ssh-keygen -t rsa   -- 一直按回车就可以生成这个文件.ssh/id_rsa.pub

所有服务器上查看本机公钥
cat .ssh/id_rsa.pub   -- 查看生成的公钥

所有服务器执行拷贝公钥
vim .ssh/authorized_keys   -- 复制前面查看到的所有公钥到这个文件中

所有服务器执行第一次访问,后面访问就不需要密码了
-- MASTER
ssh root@172.168.101.195
ssh root@172.168.101.193
ssh root@172.168.101.194

--STANDBY-MASTER
ssh root@172.168.101.191
ssh root@172.168.101.193
ssh root@172.168.101.194

--SLAVE
ssh root@172.168.101.195
ssh root@172.168.101.191
ssh root@172.168.101.194

-- Manager
ssh root@172.168.101.195
ssh root@172.168.101.193

ssh root@172.168.101.191

4.2 上传 MHA 安装包

```
# MASTER, STANDBY-MASTER, SLAVE #
rz              -- 选择 mha4mysql-node-0.56.tar.gz 上传
# MANAGER #
rz              -- 选择 mha4mysql-node-0.56.tar.gz 和 mha4mysql-manager-0.56.tar.gz 上传
```

4.3 MHA node 节点的安装

4.3.1 安装依赖包

```
# MASTER, STANDBY-MASTER, SLAVE 服务器 #
yum install perl-DBD-MySQL perl-CPAN -y
```

4.3.2 node 安装

```
tar zxvf mha4mysql-node-0.56.tar.gz
cd mha4mysql-node-0.56
perl Makefile.PL
make && make install
```

```
# 安装完成可以看到以下脚本 #
```

```
-r-xr-xr-x 1 root root 16367 Mar  4 17:01 apply_diff_relay_logs
-r-xr-xr-x 1 root root  4807 Mar  4 17:01 filter_mysqlbinlog
-r-xr-xr-x 1 root root  8261 Mar  4 17:01 purge_relay_logs
-r-xr-xr-x 1 root root  7525 Mar  4 17:01 save_binary_logs
```

4.4 MHA MANAGER 节点安装

4.4.1 安装依赖包

```
# MANAGER 服务器 #
yum install perl-DBD-MySQL perl-CPAN perl-Config-Tiny perl-Log-Dispatch perl-Parallel-
ForkManager perl-Time-HiRes -y
```
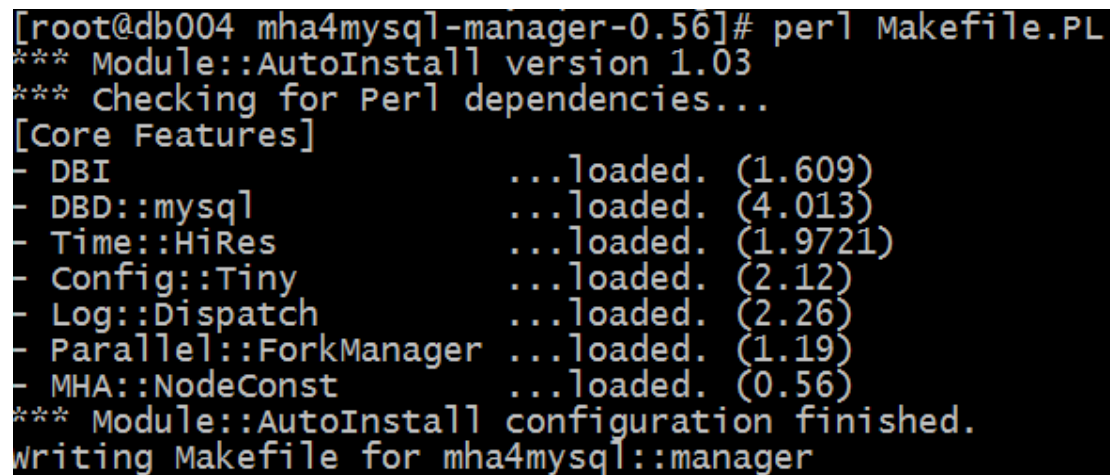
4.4.2 安装 node 包

tar zxvf mha4mysql-node-0.56.tar.gz

cd mha4mysql-node-0.56

perl Makefile.PL

make && make install

4.4.3 安装 manager 包

perl -MCPAN -e "install Parallel::ForkManager"

perl -MCPAN -e "install Log::Dispatch"

tar zxvf mha4mysql-node-0.56.tar.gz

cd mha4mysql-node-0.56

perl Makefile.PL

make && make install

--出现以下信息则代表 manager 依赖包没问题,可以进行编译及安装

完成后可以看到以下脚本

```
-r-xr-xr-x 1 root root 16367 Mar  4 17:27 apply_diff_relay_logs
-r-xr-xr-x 1 root root  4807 Mar  4 17:27 filter_mysqlbinlog
-r-xr-xr-x 1 root root  1995 Mar  4 17:36 masterha_check_repl
-r-xr-xr-x 1 root root  1779 Mar  4 17:36 masterha_check_ssh
-r-xr-xr-x 1 root root  1865 Mar  4 17:36 masterha_check_status
-r-xr-xr-x 1 root root  3201 Mar  4 17:36 masterha_conf_host
-r-xr-xr-x 1 root root  2517 Mar  4 17:36 masterha_manager
-r-xr-xr-x 1 root root  2165 Mar  4 17:36 masterha_master_monitor
-r-xr-xr-x 1 root root  2373 Mar  4 17:36 masterha_master_switch
-r-xr-xr-x 1 root root  5171 Mar  4 17:36 masterha_secondary_check
-r-xr-xr-x 1 root root  1739 Mar  4 17:36 masterha_stop
-rwxr-xr-x 1 root root  3218 Mar  6 14:49 master_ip_failover
-rwxr-xr-x 1 root root  3648 Mar  6 11:01 master_ip_failover_old
-rwxr-xr-x 1 root root  1464 Mar  6 15:04 master_ip_online_change
-r-xr-xr-x 1 root root  8261 Mar  4 17:27 purge_relay_logs
-r-xr-xr-x 1 root root  7525 Mar  4 17:27 save_binary_logs
```

4.4.4 manager 配置文件

mkdir -p /etc/masterha
cp mha4mysql-manager-0.56/samples/conf/app1.cnf /etc/masterha/
mkdir /data/masterha/app1 -p

vim /etc/masterha/app1.cnf   # 修改配置文件，见附录 1 #
vim /usr/local/bin/master_ip_failover   # 见附录 2 #
vim /usr/local/bin/master_ip_online_change   # 见附录 3 #

4.4.5 检查 ssh 状态

masterha_check_ssh --conf=/etc/masterha/app1.cnf
Sat Mar   4 18:09:40 2017 - [warning] Global configuration file /etc/masterha_default.cnf not found. Skipping.
Sat Mar   4 18:09:40 2017 - [info] Reading application default configuration from /etc/masterha/app1.cnf..
Sat Mar   4 18:09:40 2017 - [info] Reading server configuration from /etc/masterha/app1.cnf..
Sat Mar   4 18:09:40 2017 - [info] Starting SSH connection tests..
Sat Mar   4 18:09:42 2017 - [debug]
Sat Mar   4 18:09:40 2017 - [debug]   Connecting via SSH from root@172.168.101.191(172.168.101.191:22) to root@172.168.101.195(172.168.101.195:22)..
Sat Mar   4 18:09:42 2017 - [debug]   ok.
Sat Mar   4 18:09:42 2017 - [debug]   Connecting via SSH from root@172.168.101.191(172.168.101.191:22) to root@172.168.101.193(172.168.101.193:22)..
Sat Mar   4 18:09:42 2017 - [debug]   ok.
Sat Mar   4 18:09:42 2017 - [debug]
Sat Mar   4 18:09:41 2017 - [debug]   Connecting via SSH from

root@172.168.101.193(172.168.101.193:22) to root@172.168.101.191(172.168.101.191:22)..
Sat Mar   4 18:09:42 2017 - [debug]   ok.
Sat   Mar   4   18:09:42   2017   -   [debug]   Connecting   via   SSH   from
root@172.168.101.193(172.168.101.193:22) to root@172.168.101.195(172.168.101.195:22)..
Sat Mar   4 18:09:42 2017 - [debug]   ok.
Sat Mar   4 18:09:48 2017 - [debug]
Sat   Mar   4   18:09:40   2017   -   [debug]   Connecting   via   SSH   from
root@172.168.101.195(172.168.101.195:22) to root@172.168.101.191(172.168.101.191:22)..
Sat Mar   4 18:09:47 2017 - [debug]   ok.
Sat   Mar   4   18:09:47   2017   -   [debug]   Connecting   via   SSH   from
root@172.168.101.195(172.168.101.195:22) to root@172.168.101.193(172.168.101.193:22)..
Sat Mar   4 18:09:47 2017 - [debug]   ok.
Sat Mar   4 18:09:48 2017 - [info] All SSH connection tests passed successfully.

4.4.6 检查 MySQL 的 replication 状态

masterha_check_repl --conf=/etc/masterha/app1.cnf
Mon Mar   6 09:50:23 2017 - [warning] Global configuration file /etc/masterha_default.cnf
not found. Skipping.
Mon Mar   6 09:50:23 2017 - [info] Reading application default configuration from
/etc/masterha/app1.cnf..
Mon   Mar   6   09:50:23   2017   -   [info]   Reading   server   configuration   from
/etc/masterha/app1.cnf..
Mon Mar   6 09:50:23 2017 - [info] MHA::MasterMonitor version 0.56.
Mon Mar   6 09:50:25 2017 - [info] GTID failover mode = 0
Mon Mar   6 09:50:25 2017 - [info] Dead Servers:
Mon Mar   6 09:50:25 2017 - [info] Alive Servers:
Mon Mar   6 09:50:25 2017 - [info]   172.168.101.191(172.168.101.191:3306)
Mon Mar   6 09:50:25 2017 - [info]   172.168.101.195(172.168.101.195:3306)
Mon Mar   6 09:50:25 2017 - [info]   172.168.101.193(172.168.101.193:3306)
Mon Mar   6 09:50:25 2017 - [info] Alive Slaves:
Mon   Mar   6   09:50:25   2017   -   [info]   172.168.101.195(172.168.101.195:3306)
Version=5.6.35-80.0-log (oldest major version between slaves) log-bin:enabled
Mon   Mar   6   09:50:25   2017   -   [info]   Replicating   from
172.168.101.191(172.168.101.191:3306)
Mon   Mar   6 09:50:25   2017 - [info]   Primary candidate for the new Master
(candidate_master is set)
Mon   Mar   6   09:50:25   2017   -   [info]   172.168.101.193(172.168.101.193:3306)
Version=5.6.35-80.0-log (oldest major version between slaves) log-bin:enabled
Mon   Mar   6   09:50:25   2017   -   [info]   Replicating   from
172.168.101.191(172.168.101.191:3306)
Mon Mar   6 09:50:25 2017 - [info]   Not candidate for the new Master (no_master is set)

Mon Mar 6 09:50:25 2017 - [info] Current Alive Master: 172.168.101.191(172.168.101.191:3306)

Mon Mar 6 09:50:25 2017 - [info] Checking slave configurations..

Mon Mar 6 09:50:25 2017 - [info] read_only=1 is not set on slave 172.168.101.195(172.168.101.195:3306).

Mon Mar 6 09:50:25 2017 - [warning] relay_log_purge=0 is not set on slave 172.168.101.195(172.168.101.195:3306).

Mon Mar 6 09:50:25 2017 - [info] read_only=1 is not set on slave 172.168.101.193(172.168.101.193:3306).

Mon Mar 6 09:50:25 2017 - [warning] relay_log_purge=0 is not set on slave 172.168.101.193(172.168.101.193:3306).

Mon Mar 6 09:50:25 2017 - [info] Checking replication filtering settings..

Mon Mar 6 09:50:25 2017 - [info] binlog_do_db= , binlog_ignore_db=

Mon Mar 6 09:50:25 2017 - [info] Replication filtering check ok.

Mon Mar 6 09:50:25 2017 - [info] GTID (with auto-pos) is not supported

Mon Mar 6 09:50:25 2017 - [info] Starting SSH connection tests..

Mon Mar 6 09:50:26 2017 - [info] All SSH connection tests passed successfully.

Mon Mar 6 09:50:26 2017 - [info] Checking MHA Node version..

Mon Mar 6 09:50:26 2017 - [info] Version check ok.

Mon Mar 6 09:50:26 2017 - [info] Checking SSH publickey authentication settings on the current master..

Mon Mar 6 09:50:27 2017 - [info] HealthCheck: SSH to 172.168.101.191 is reachable.

Mon Mar 6 09:50:27 2017 - [info] Master MHA Node version is 0.56.

Mon Mar 6 09:50:27 2017 - [info] Checking recovery script configurations on 172.168.101.191(172.168.101.191:3306)..

Mon Mar 6 09:50:27 2017 - [info] Executing command: save_binary_logs --command=test --start_pos=4 --binlog_dir=/data/mysqlbinlog --output_file=/var/tmp/save_binary_logs_test --manager_version=0.56 --start_file=mysql_bin.000008

Mon Mar 6 09:50:27 2017 - [info] Connecting to root@172.168.101.191(172.168.101.191:22)..

  Creating /var/tmp if not exists..   ok.
  Checking output directory is accessible or not..
   ok.
  Binlog found at /data/mysqlbinlog, up to mysql_bin.000008

Mon Mar 6 09:50:27 2017 - [info] Binlog setting check done.

Mon Mar 6 09:50:27 2017 - [info] Checking SSH publickey authentication and checking recovery script configurations on all alive slave servers..

Mon Mar 6 09:50:27 2017 - [info] Executing command : apply_diff_relay_logs --command=test --slave_user='mha_monitor' --slave_host=172.168.101.195 --slave_ip=172.168.101.195 --slave_port=3306 --workdir=/var/tmp --target_version=5.6.35-80.0-log --manager_version=0.56 --relay_log_info=/data/ane56/relay-log.info --relay_dir=/data/ane56/ --slave_pass=xxx

Mon Mar 6 09:50:27 2017 - [info] Connecting to

root@172.168.101.195(172.168.101.195:22)..

　　Checking slave recovery environment settings..

　　　Opening /data/ane56/relay-log.info ... ok.

　　　Relay log found at /data/ane56, up to mysql-relay-bin.000012

　　　Temporary relay log file is /data/ane56/mysql-relay-bin.000012

　　　Testing mysql connection and privileges..Warning: Using a password on the command line interface can be insecure.

　done.

　　　Testing mysqlbinlog output.. done.

　　　Cleaning up test file(s).. done.

Mon Mar　6 09:50:27 2017 - [info]　　Executing command : apply_diff_relay_logs --command=test　　--slave_user='mha_monitor'　　--slave_host=172.168.101.193　　--slave_ip=172.168.101.193 --slave_port=3306 --workdir=/var/tmp --target_version=5.6.35-80.0-log　--manager_version=0.56　--relay_log_info=/data/ane56/relay-log.info　--relay_dir=/data/ane56/　--slave_pass=xxx

Mon　Mar　6　09:50:27　2017　-　[info]　　　Connecting　to root@172.168.101.193(172.168.101.193:22)..

　　Checking slave recovery environment settings..

　　　Opening /data/ane56/relay-log.info ... ok.

　　　Relay log found at /data/ane56, up to mysql-relay-bin.000012

　　　Temporary relay log file is /data/ane56/mysql-relay-bin.000012

　　　Testing mysql connection and privileges..Warning: Using a password on the command line interface can be insecure.

　done.

　　　Testing mysqlbinlog output.. done.

　　　Cleaning up test file(s).. done.

Mon Mar　6 09:50:28 2017 - [info] Slaves settings check done.

Mon Mar　6 09:50:28 2017 - [info]

172.168.101.191(172.168.101.191:3306) (current master)

　+--172.168.101.195(172.168.101.195:3306)

　+--172.168.101.193(172.168.101.193:3306)

Mon Mar　6 09:50:28 2017 - [info] Checking replication health on 172.168.101.195..

Mon Mar　6 09:50:28 2017 - [info]　ok.

Mon Mar　6 09:50:28 2017 - [info] Checking replication health on 172.168.101.193..

Mon Mar　6 09:50:28 2017 - [info]　ok.

Mon Mar　6 09:50:28 2017 - [warning] master_ip_failover_script is not defined.

Mon Mar　6 09:50:28 2017 - [warning] shutdown_script is not defined.

Mon Mar　6 09:50:28 2017 - [info] Got exit code 0 (Not master dead).

MySQL Replication Health is OK.

4.4.7 启动 MHA manager

masterha_manager --conf=/etc/masterha/app1.cnf &

4.4.8 状态检查

masterha_check_status --conf=/etc/masterha/app1.cnf
app1 (pid:26406) is running(0:PING_OK), master:172.168.101.191

4.4.9 部署完成

附录 1

[server default]
manager_workdir=/data/masterha/app1
manager_log=/data/masterha/app1/manager.log
user=mha_monitor
password=mha_monitor
ping_interval=5
repl_user=repl
repl_password=qwe123
master_ip_failover_script=/usr/local/bin/master_ip_failover
#master_ip_online_change_script=/usr/local/bin/master_ip_online_change

[server1]
hostname=172.168.101.191
port=3306
#candidate_master=1
master_binlog_dir=/data/mysqlbinlog

[server2]
hostname=172.168.101.195
port=3306
candidate_master=1
master_binlog_dir=/data/mysqlbinlog

check_repl_delay=0

[server3]
hostname=172.168.101.193
master_binlog_dir=/data/mysqlbinlog
port=3306
no_master=1

附录 2

```perl
## /usr/local/bin/master_ip_failover ##
#!/usr/bin/env perl
use strict;
use warnings FATAL =>'all';

use Getopt::Long;

my (
$command,          $ssh_user,          $orig_master_host, $orig_master_ip,
$orig_master_port, $new_master_host, $new_master_ip,      $new_master_port
);

my $vip = '172.168.101.199/24';    # Virtual IP
my $key = "0";
my $ssh_start_vip = "/sbin/ifconfig eth0:$key $vip";
my $ssh_stop_vip = "/sbin/ifconfig eth0:$key down";
my $exit_code = 0;

GetOptions(
'command=s'            => \$command,
'ssh_user=s'           => \$ssh_user,
'orig_master_host=s' => \$orig_master_host,
'orig_master_ip=s'     => \$orig_master_ip,
'orig_master_port=i' => \$orig_master_port,
'new_master_host=s'    => \$new_master_host,
'new_master_ip=s'      => \$new_master_ip,
'new_master_port=i'    => \$new_master_port,
);

exit &main();

sub main {
```

```perl
#print "\n\nIN SCRIPT TEST====$ssh_stop_vip==$ssh_start_vip===\n\n";

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

        # $orig_master_host, $orig_master_ip, $orig_master_port are passed.
        # If you manage master ip address at global catalog database,
        # invalidate orig_master_ip here.
        my $exit_code = 1;
        eval {
            print "\n\n\n***************************************************************\n";
            print "Disabling the VIP - $vip on old master: $orig_master_host\n";
            print "***************************************************************\n\n\n\n";
&stop_vip();
            $exit_code = 0;
        };
        if ($@) {
            warn "Got Error: $@\n";
            exit $exit_code;
        }
        exit $exit_code;
}
elsif ( $command eq "start" ) {

        # all arguments are passed.
        # If you manage master ip address at global catalog database,
        # activate new_master_ip here.
        # You can also grant write access (create user, set read_only=0, etc) here.
my $exit_code = 10;
        eval {
            print "\n\n\n***************************************************************\n";
            print "Enabling the VIP - $vip on new master: $new_master_host \n";
            print "***************************************************************\n\n\n\n";
&start_vip();
            $exit_code = 0;
        };
        if ($@) {
            warn $@;
            exit $exit_code;
        }
        exit $exit_code;
}
elsif ( $command eq "status" ) {
        print "Checking the Status of the script.. OK \n";
```

```
        `ssh $ssh_user\@$orig_master_host \" $ssh_start_vip \"`;
        exit 0;
}
else {
&usage();
        exit 1;
}
}

# A simple system call that enable the VIP on the new master
sub start_vip() {
`ssh $ssh_user\@$new_master_host \" $ssh_start_vip \"`;
}
# A simple system call that disable the VIP on the old_master
sub stop_vip() {
`ssh $ssh_user\@$orig_master_host \" $ssh_stop_vip \"`;
}

sub usage {
print
"Usage: master_ip_failover –command=start|stop|stopssh|status –orig_master_host=host –orig_master_ip=ip –orig_master_port=po
rt –new_master_host=host –new_master_ip=ip –new_master_port=port\n";
}
```

附录 3

```
## /usr/local/bin/master_ip_online_change ##
#/bin/bash
source /root/.bash_profile

vip=`echo '172.168.101.199/24'`    # Virtual IP
key=`echo '0'`

command=`echo "$1" | awk -F = '{print $2}'`
orig_master_host=`echo "$2" | awk -F = '{print $2}'`
new_master_host=`echo "$7" | awk -F = '{print $2}'`
orig_master_ssh_user=`echo "${12}" | awk -F = '{print $2}'`
new_master_ssh_user=`echo "${13}" | awk -F = '{print $2}'`
```

```
stop_vip=`echo "ssh root@$orig_master_host /sbin/ifconfig   eth0:$key   down"`
start_vip=`echo "ssh root@$new_master_host /sbin/ifconfig   eth0:$key   $vip"`

if [ $command = 'stop' ]
    then
    echo -e "\n\n\n*******************************************************************\n"
    echo -e "Disabling the VIP - $vip on old master: $orig_master_host\n"
    $stop_vip
    if [ $? -eq 0 ]
        then
        echo "Disabled the VIP successfully"
    else
        echo "Disabled the VIP failed"
    fi
    echo -e "*************************************************************\n\n\n\n"
fi


if [ $command = 'start' -o $command = 'status' ]
    then
    echo -e "\n\n\n*******************************************************************\n"
    echo -e "Enabling the VIP - $vip on new master: $new_master_host \n"
    $start_vip
    if [ $? -eq 0 ]
        then
        echo "Enabled the VIP successfully"
    else
        echo "Enabled the VIP failed"
    fi
    echo -e "*************************************************************\n\n\n\n"
fi
```