集群知识点回顾：

什么是集群？ 多台服务器提供相同服务（网站服务 数据库服务）

集群类型？

LB(负载均衡集群) 集群中的所有服务器平均分摊客户端的多次连接访问 HA(高可用集群) 备用的服务器会自动接替故障的主服务器，继续提供服务，这个过程对客户端来说是透明的。

集群服务软件有那些？ LVS Haproxy Nginx Keepalived

MHA软件介绍

集群拓扑结构

MHA的工作过程

集群环境准备

集群环境准备

1、配置三台数据库服务器 51 、 52 、53

彼此之间可以使用对方的系统root用户ssh免密登录。

202 ssh-keygen

203 ssh-copy-id root@192.168.4.52

204 ssh-copy-id root@192.168.4.53

205 history

206 ssh root@192.168.4.52

207 ssh root@192.168.4.53

86 ssh-keygen

87 ssh-copy-id root@192.168.4.51

88 ssh-copy-id root@192.168.4.53

89 ssh root@192.168.4.51

90 ssh root@192.168.4.53

65 ssh-keygen

66 ssh-copy-id root@192.168.4.51

67 ssh-copy-id root@192.168.4.52

68 ssh root@192.168.4.51

69 ssh root@192.168.4.52

2、配置 57 主机 可以免密ssh连接3台数据库服务器 51 、 52 、53

47 ssh-keygen

48 ssh-copy-id root@192.168.4.51

49 ssh-copy-id root@192.168.4.52

50 ssh-copy-id root@192.168.4.53

51 ssh root@192.168.4.51

52 ssh root@192.168.4.52

53 ssh root@192.168.4.53

3、分别在 51 、 52 、53 、 57 主机 安装mha目录下的所有 perl 软件

cd mha

yum -y install perl-\*.rpm

4、配置 MySQL一主多从结构 ,具体步骤如下：

提示 确保3台服务器的数据是一致的 。

配置主数据库服务器 192.168.4.51

启用binlog日志

用户授权

查看日志信息

[root@host51 mha]# vim /etc/my.cnf

[mysqld]

server\_id=51

log\_bin=master51

:wq

[root@host51 mha]# systemctl restart mysqld

[root@host51 mha]# mysql -uroot -p密码

mysql> grant replication slave on \*.\* to repluser@"%" identified by "123qqq...A";

mysql> show master status;

+-----------------+----------+--------------+------------------+-------------------+

| File | Position | Binlog\_Do\_DB | Binlog\_Ignore\_DB | Executed\_Gtid\_Set |

+-----------------+----------+--------------+------------------+-------------------+

| master51.000001 | 441 | | | |

+-----------------+----------+--------------+------------------+-------------------+

1 row in set (0.01 sec)

mysql>

配置从数据库服务器 192.168.4.52

[root@host52 mha]# vim /etc/my.cnf

[mysqld]

server\_id=52

:wq

[root@host52 mha]# systemctl restart mysqld

[root@host52 mha]# mysql -uroot -p密码

mysql> change master to master\_host="192.168.4.51" , master\_user="repluser" , master\_password="123qqq...A" , master\_log\_file="master51.000001" , master\_log\_pos=441;

Query OK, 0 rows affected, 2 warnings (0.04 sec)

mysql> start slave;

Query OK, 0 rows affected (0.02 sec)

mysql> show slave status \G

Slave\_IO\_Running: Yes

Slave\_SQL\_Running: Yes

配置从数据库服务器 192.168.4.53

[root@host53 mha]# vim /etc/my.cnf

[mysqld]

server\_id=53

:wq

[root@host53 mha]# systemctl restart mysqld

[root@host53 mha]# mysql -uroot -p密码

mysql> change master to master\_host="192.168.4.51" , master\_user="repluser" , master\_password="123qqq...A" , master\_log\_file="master51.000001" , master\_log\_pos=441;

mysql> start slave;

mysql> show slaver status \G

Slave\_IO\_Running: Yes

Slave\_SQL\_Running: Yes

配置管理主机192.168.4.57（重点） 具体如下：

1 安装MHA软件

[root@host57 ~]# cd mha

[root@host57 mha]# yum -y install mha4mysql-node-0.56-0.el6.noarch.rpm

]#tar -zxvf mha4mysql-manager-0.56.tar.gz

]#cd mha4mysql-manager-0.56

]#perl Makefile.PL

]# make

]# make install

2 创建并编辑管理服务的主配置文件

[root@host57 mha4mysql-manager-0.56]# mkdir /etc/mha

[root@host57 mha4mysql-manager-0.56]# cp samples/conf/app1.cnf /etc/mha/

[root@host57 mha4mysql-manager-0.56]# vim /etc/mha/app1.cnf

[root@host57 mha4mysql-manager-0.56]# vim /etc/mha/app1.cnf

[server default] //管理服务默认配置

manager\_workdir=/etc/mha //工作目录

manager\_log=/etc/mha/manager.log //日志文件

master\_ip\_failover\_script=/etc/mha/master\_ip\_failover //故障切换脚本

ssh\_user=root //访问ssh服务用户

ssh\_port=22 //ssh服务端口

repl\_user=repluser //数据同步授权用户

repl\_password=123qqq…A //密码

user=root //监控用户

password=123qqq…A //密码

[server1] //指定第1台数据库服务器

hostname=192.168.4.51 //服务器ip地址

port=3306 //服务端口

candidate\_master=1 //竞选主服务器

[server2] //指定第2台数据库服务器

hostname=192.168.4.52

port=3306

candidate\_master=1

[server3] //指定第3台数据库服务器

hostname=192.168.4.53

port=3306

candidate\_master=1

:wq

3 创建故障切换脚本，并指定vip地址

[root@host57 ~]# cp mha/master\_ip\_failover /etc/mha/

[root@host57 ~]# vim +35 /etc/mha/master\_ip\_failover

my $vip = '192.168.4.100/24'; # Virtual IP

my $key = "1";

my $ssh\_start\_vip = "/sbin/ifconfig ens33:$key $vip";

my $ssh\_stop\_vip = "/sbin/ifconfig ens33:$key down";

:wq

[root@host57 ~]# chmod +x /etc/mha/master\_ip\_failover

4 把vip地址 配置在当前的主数据库服务器192.168.4.51上

[root@host51 mha]# ifconfig ens33:1 192.168.4.100

[root@host51 mha]# ifconfig ens33:1

配置3台数据库服务器，具体配置如下

1 安装软件

[root@host51 ~]# cd mha/

[root@host51 mha]# yum -y install mha4mysql-node-0.56-0.el6.noarch.rpm

[root@host52 ~]# cd mha/

[root@host52 mha]# yum -y install mha4mysql-node-0.56-0.el6.noarch.rpm

[root@host53 ~]# cd mha/

[root@host53 mha]# yum -y install mha4mysql-node-0.56-0.el6.noarch.rpm

2 添加授权用户 (监控用户root)

[root@host51 ~]# mysql -uroot -p123qqq...A -e 'grant all on \*.\* to root@"%" identified by "123qqq...A"'

[root@host52 ~]# mysql -uroot -p123qqq...A -e 'show grants for root@"%"'

[root@host53 ~]# mysql -uroot -p123qqq...A -e 'show grants for root@"%"'

优化数据库服务器的配置，如下

1 修改3台数据库服务器的/etc/my.cnf 文件 ，安装master模块和slave模块 并启用。 和 禁止删除本机的中继日志文件

2 在 52 和 53 主机启用binlog日志

3 在 52 和 53 主机添加从服务器同步数据时的连接用repluser

[root@host51 mysql]# vim /etc/my.cnf

[mysqld]

plugin-load="rpl\_semi\_sync\_master=semisync\_master.so;rpl\_semi\_sync\_slave=semisync\_slave.so"

rpl\_semi\_sync\_master\_enabled=1

rpl\_semi\_sync\_slave\_enabled=1

relay\_log\_purge=0

:wq

[root@host51 mysql]# systemctl restart mysqld

[root@host52 mysql]# vim /etc/my.cnf

[mysqld]

server\_id=52

plugin-load="rpl\_semi\_sync\_master=semisync\_master.so;rpl\_semi\_sync\_slave=semisync\_slave.so"

rpl\_semi\_sync\_master\_enabled=1

rpl\_semi\_sync\_slave\_enabled=1

relay\_log\_purge=0

log\_bin=master52

:wq

[root@host52 mysql]# systemctl restart mysqld

[root@host52 mysql]# mysql -uroot -p123qqq...A -e 'grant replication slave on \*.\* to repluser@"%" identified by "123qqq...A"'

[root@host52 mysql]# mysql -uroot -p123qqq...A -e 'show slave status \G' | grep -i yes

mysql: [Warning] Using a password on the command line interface can be insecure.

Slave\_IO\_Running: Yes

Slave\_SQL\_Running: Yes

[root@host53 mysql]# vim /etc/my.cnf

[mysqld]

server\_id=53

plugin-load="rpl\_semi\_sync\_master=semisync\_master.so;rpl\_semi\_sync\_slave=semisync\_slave.so"

rpl\_semi\_sync\_master\_enabled=1

rpl\_semi\_sync\_slave\_enabled=1

relay\_log\_purge=0

log\_bin=master53

:wq

[root@host53 mysql]# systemctl restart mysqld

[root@host53 mysql]# mysql -uroot -p123qqq...A -e 'grant replication slave on \*.\* to repluser@"%" identified by "123qqq...A"'

[root@host53 mysql]# mysql -uroot -p123qqq...A -e 'show slave status \G' | grep -i yes

mysql: [Warning] Using a password on the command line interface can be insecure.

Slave\_IO\_Running: Yes

Slave\_SQL\_Running: Yes

[root@host53 mysql]#

测试配置

[root@host57 ~]# masterha\_check\_ssh --conf=/etc/mha/app1.cnf

Tue Aug 25 17:19:11 2020 - [info] All SSH connection tests passed successfully.

[root@host57 ~]# masterha\_check\_repl --conf=/etc/mha/app1.cnf

MySQL Replication Health is OK.

启动管理服务（启动信息会占终端显示）

[root@host57 ~]# masterha\_manager --conf=/etc/mha/app1.cnf --remove\_dead\_master\_conf --ignore\_last\_failover

Tue Aug 25 17:36:46 2020 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.

Tue Aug 25 17:36:46 2020 - [info] Reading application default configuration from /etc/mha/app1.cnf..

Tue Aug 25 17:36:46 2020 - [info] Reading server configuration from /etc/mha/app1.cnf..

查看管理服务的运行状态（开一个新终端查看）

[root@host57 ~]# masterha\_check\_status --conf=/etc/mha/app1.cnf

app1 (pid:10355) is running(0:PING\_OK), master:192.168.4.51

[root@host57 ~]#

在当前主服务器51 查看vip地址

[root@host51 ~]# ifconfig ens33:1

ens33:1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

inet 192.168.4.100 netmask 255.255.255.0 broadcast 192.168.4.255

ether 00:0c:29:1a:05:3d txqueuelen 1000 (Ethernet)

device interrupt 19 base 0x2000

客户端50主机连接vip 地址访问数据库服务，存取数据

命令格式 mysql -h192.168.4.100 -u用户 -p密码

1 在主服务器51 添加客户端连接服务使用的用户名和密码

[root@host51 ~]# mysql -uroot -p123qqq...A -e 'create database bbsdb'mysql:

[root@host51 ~]# mysql -uroot -p123qqq...A -e 'create table bbsdb.t1(id int)'

[root@host51 ~]# mysql -uroot -p123qqq...A -e 'grant select,insert on bbsdb.\* to plj@"%" identified by "123qqq...A"'

2 从数据库服务器52 和 53 会自动同步添加的用户

[root@host52 ~]# mysql -uroot -p123qqq...A -e 'show grants for plj@"%"'

[root@host53 ~]# mysql -uroot -p123qqq...A -e 'show grants for plj@"%"'

[root@host52 ~]# mysql -uroot -p123qqq...A -e 'use bbsdb;show tables'

[root@host53 ~]# mysql -uroot -p123qqq...A -e 'use bbsdb;show tables'

3 客户端连接vip 地址访问数据库服务，存取数据

[root@host50 ~]# ping -c 2 192.168.4.100

[root@host50 ~]# mysql -h192.168.4.100 -uplj -p123qqq...A

ysql> select @@hostname;

+------------+

| @@hostname |

+------------+

| host51 |

+------------+

1 row in set (0.01 sec)

mysql> insert into bbsdb.t1 values(1);

Query OK, 1 row affected (0.09 sec)

mysql> select \* from bbsdb.t1;

+------+

| id |

+------+

| 1 |

+------+

1 row in set (0.00 sec)

mysql>

排错思路：

查看检查的输出信息

ssh免密登录 没成功

主从结构不正常 （52 和 53 的io 线程 和 sql线程要是是yes状态）

MySQL数据库服务器的优化配置是否配置正确

请认真检查 app1.cnf文件的编写

所有主机防火墙 要关闭。

软件包没有安装完全

测试mha集群高可用功能：

1 当51 主机宕机时 ，客户端依然可以连接地址100访问数据库服务存取数据

host51]# systemctl stop mysqld

host50]# mysql -h192.168.4.100 -uplj -p123qqq...A

2 在2台备用的数据库服务器查看vip地址（谁获取到了vip地址，谁就是新的主数据库服务器）

host52]# ip addr show | grep "192.168.4.100"

host53]# ip addr show | grep "192.168.4.100"

3 在另数据库服务器查slave进程进程的状态，会自动到新的主数据库服务器同步数据

]# mysql -uroot -p123qqq...A -e ' show slave status \G' | grep -i "master\_host"

]# mysql -uroot -p123qqq...A -e ' show slave status \G' | grep -i yes

4 查看app1.cnf文件 会发现 数据服务器192.168.4.51 的配置自动被删除

host57]# cat /etc/mha/app1.cnf

5 查看管理服务的状态，发现管理服务自动停止了

[root@host57 ~]# masterha\_check\_status --conf=/etc/mha/app1.cnf

6 检查主从同步配置，启动管理服务，使其可以监视新的主数据库服务器

[root@host57 ~]# masterha\_check\_ssh --conf=/etc/mha/app1.cnf

[root@host57 ~]# masterha\_check\_repl --conf=/etc/mha/app1.cnf

[root@host57 ~]# masterha\_manager --conf=/etc/mha/app1.cnf --remove\_dead\_master\_conf --ignore\_last\_failover

[root@host57 ~]# masterha\_check\_status --conf=/etc/mha/app1.cnf

app1 (pid:4719) is running(0:PING\_OK), master:192.168.4.52

[root@host57 ~]#

把故障的服务器51，再添加到集群里

1 配置数据库服务器51

启动MySQL服务

[root@host51 ~]# systemctl start mysqld

确保与当前master 服务器数据一致

[root@host52 ~]# mysqldump -uroot -p123qqq...A bbsdb > /root/bbsdb.sql

[root@host52 ~]# scp /root/bbsdb.sql root@192.168.4.51:/opt/

[root@host51 ~]# mysql -uroot -p123qqq...A bbsdb < /opt/bbsdb.sql

查看日志信息

[root@host52 ~]# mysql -uroot -p123qqq...A -e 'show master status'

mysql: [Warning] Using a password on the command line interface can be insecure.

+-----------------+----------+--------------+------------------+-------------------+

| File | Position | Binlog\_Do\_DB | Binlog\_Ignore\_DB | Executed\_Gtid\_Set |

+-----------------+----------+--------------+------------------+-------------------+

| master52.000001 | 941 | | | |

+-----------------+----------+--------------+------------------+-------------------+

[root@host52 ~]#

指定主服务器信息

[root@host51 ~]# mysql -uroot -p123qqq...A -e ' change master to master\_host="192.168.4.52" , master\_user="repluser", master\_password="123qqq...A",master\_log\_file="master52.000001",master\_log\_pos=941'

[root@host51 ~]# mysql -uroot -p123qqq...A -e ' start slave'

[root@host51 ~]# mysql -uroot -p123qqq...A -e ' show slave status \G' | grep -i yes

mysql: [Warning] Using a password on the command line interface can be insecure.

Slave\_IO\_Running: Yes

Slave\_SQL\_Running: Yes

[root@host51 ~]#

[root@host51 ~]# mysql -uroot -p123qqq...A -e ' show slave status \G' | grep -i "master\_host"

mysql: [Warning] Using a password on the command line interface can be insecure.

Master\_Host: 192.168.4.52

[root@host51 ~]#

2 配置管理主机57

把51 主机添加到 app1.cnf文件里

[root@host57 ~]# vi /etc/mha/app1.cnf

[server1]

candidate\_master=1

hostname=192.168.4.51

port=3306

:wq

测试ssh连接

[root@host57 ~]# masterha\_check\_ssh --conf=/etc/mha/app1.cnf

Wed Aug 26 10:52:42 2020 - [info] All SSH connection tests passed successfully.

测试主从同步

[root@host57 ~]# masterha\_check\_repl --conf=/etc/mha/app1.cnf

MySQL Replication Health is OK.

停止当前的管理服务

[root@host57 ~]# masterha\_stop --conf=/etc/mha/app1.cnf

Stopped app1 successfully.

[root@host57 ~]#

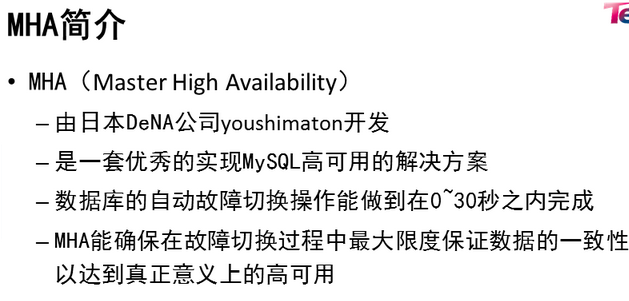
启动管理服务

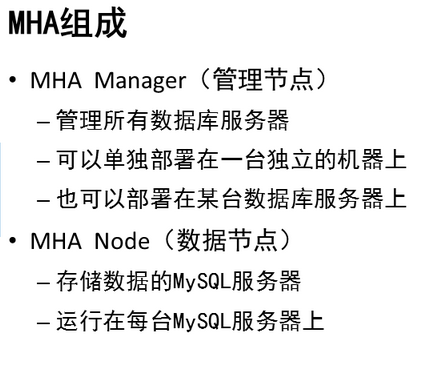
[root@host57 ~]# masterha\_manager --conf=/etc/mha/app1.cnf --remove\_dead\_master\_conf --ignore\_last\_failover

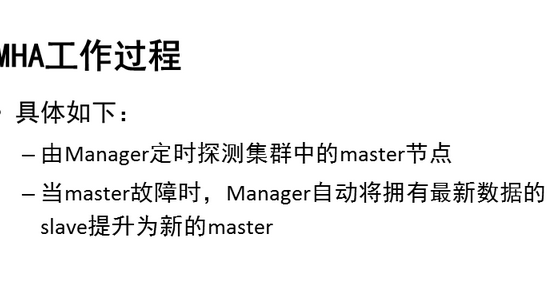
Wed Aug 26 10:56:06 2020 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.

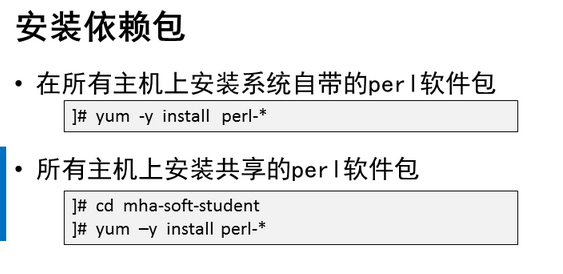
Wed Aug 26 10:56:06 2020 - [info] Reading application default configuration from /etc/mha/app1.cnf..

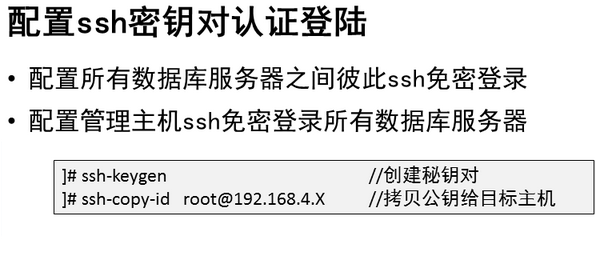
Wed Aug 26 10:56:06 2020 - [info] Reading server configuration from /etc/mha/app1.cnf..

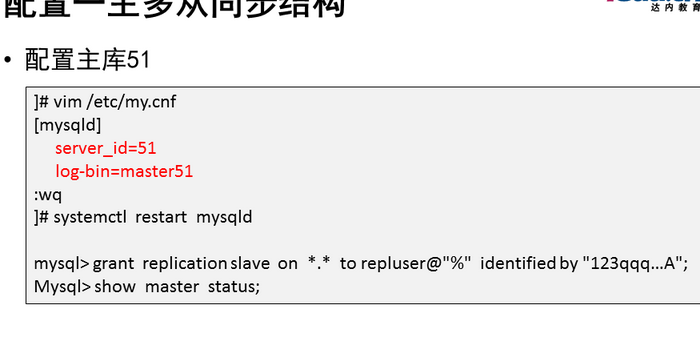


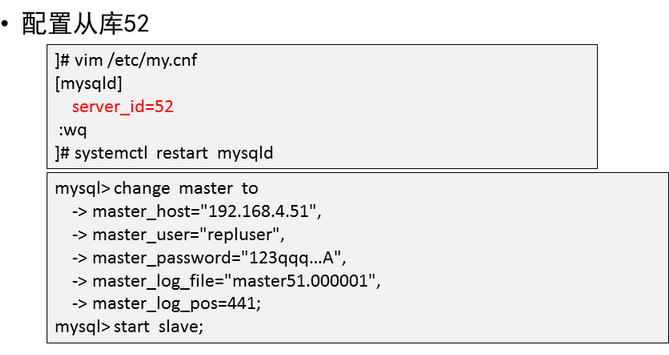


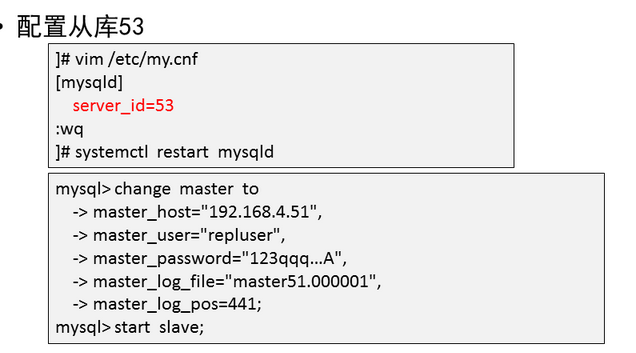




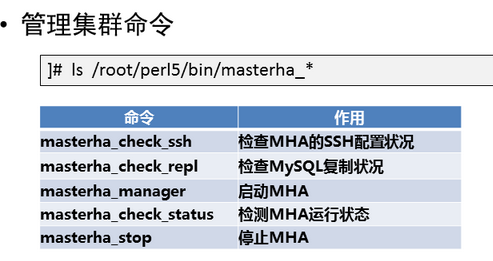


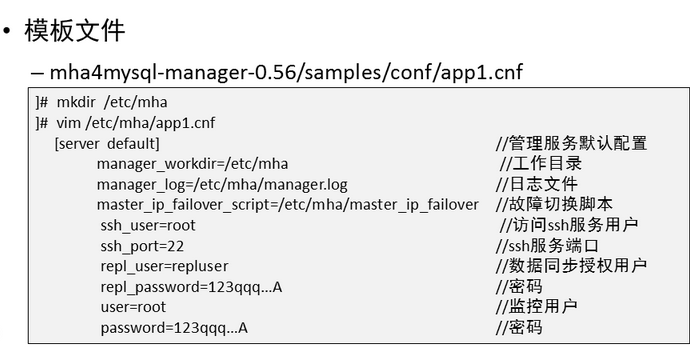






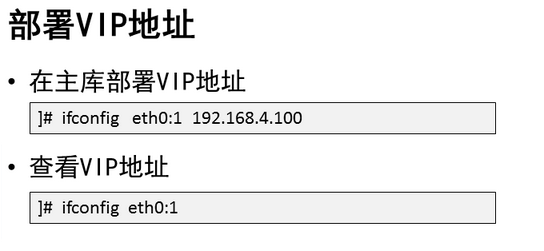


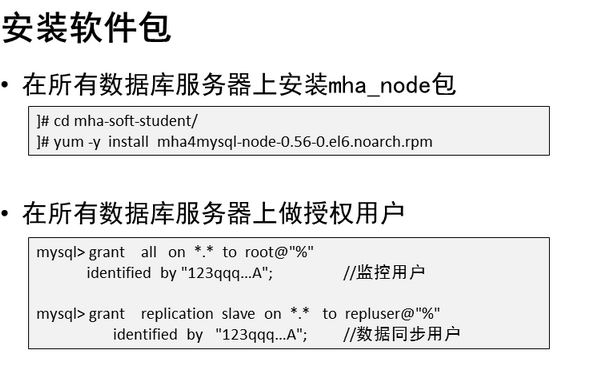


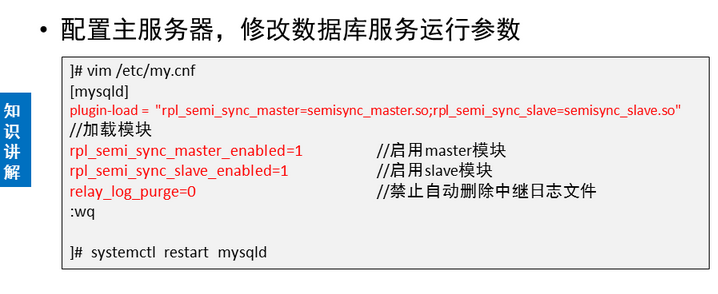


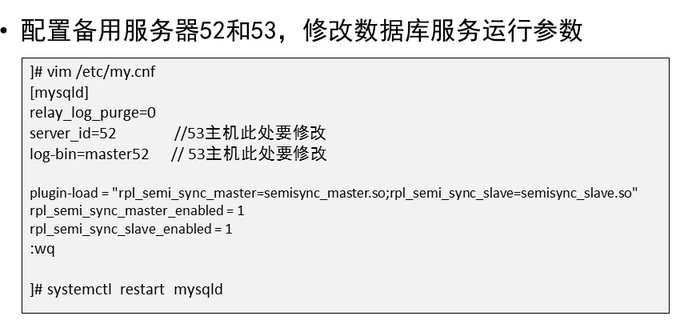










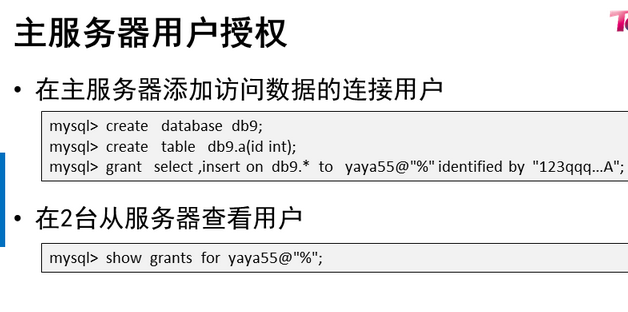


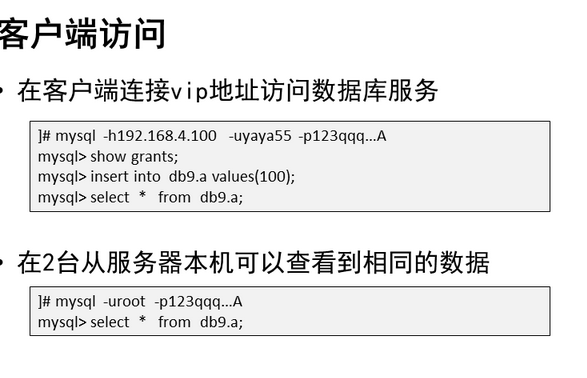


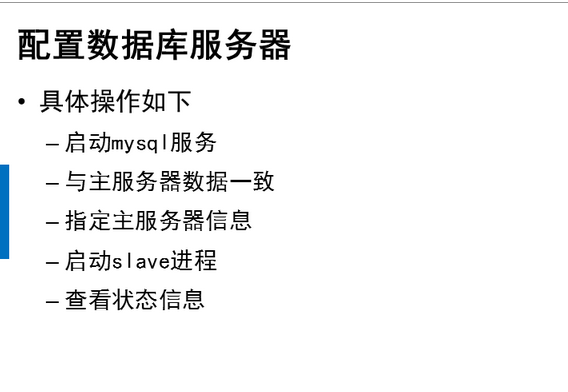


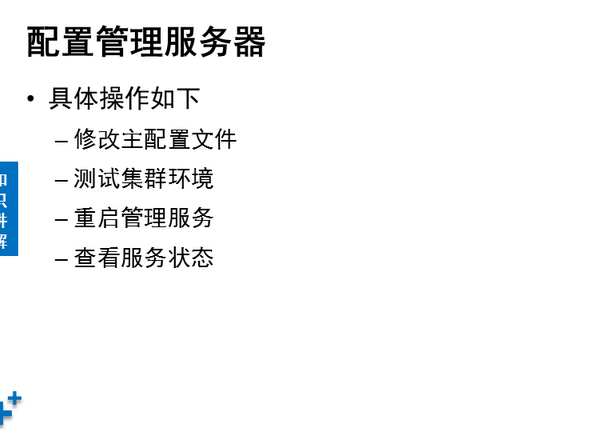












**NSD RDBM2 DAY04**

1. [案例1：准备MHA集群环境](http://tts.tmooc.cn/ttsPage/LINUX/NSDTN202001/RDBMS2/DAY04/CASE/01/index.html#case1)
2. [案例2：部署MHA集群](http://tts.tmooc.cn/ttsPage/LINUX/NSDTN202001/RDBMS2/DAY04/CASE/01/index.html#case2)
3. [案例3：测试配置](http://tts.tmooc.cn/ttsPage/LINUX/NSDTN202001/RDBMS2/DAY04/CASE/01/index.html#case3)

**1 案例1：准备MHA集群环境**

**1.1 问题**

* 配置SSH免密登录
* 安装依赖包
* 配置MySQL一主多从结构

**1.2 方案**

准备5台虚拟机，角色规划如图-1所示。

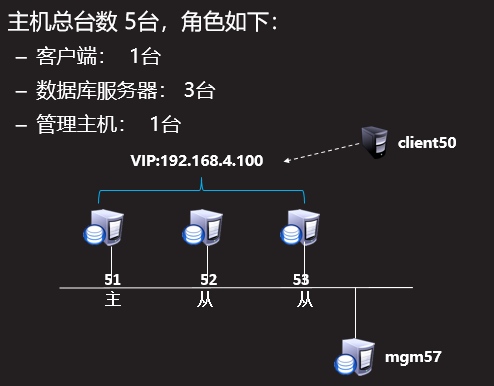


图-1

IP规划，如图-2所示：



图-2

**1.3 步骤**

实现此案例需要按照如下步骤进行。

步骤一： 配置ssh免密登录

1）配置数据库服务器192.168.4.51

[root@host51 ~]# ssh-keygen //创建秘钥对

Generating public/private rsa key pair.

Enter file in which to save the key (/root/.ssh/id\_rsa): //回车

Enter passphrase (empty for no passphrase): //回车

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:

SHA256:qb7EZByHad3Jadr+zkiEbo7ZKGmCNlctgp+Wfp3Yad0 root@pxcnode71

The key's randomart image is:

+---[RSA 2048]----+

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+----[SHA256]-----+

[root@host51 ~]#

[root@host51 ~]# ssh-copy-id root@192.168.4.52 //传递公钥给host52主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.71's password: //输入host52主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.52'"

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

[root@host51 ~]#

[root@host51 ~]# ssh-copy-id root@192.168.4.53 //传递公钥给host53主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.71's password: //输入host53主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.53'"

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

[root@host51 ~]#

[root@host51 ~]# ssh root@192.168.4.52 //可以无密码连接52主机

Last login: Fri Jun 21 13:21:39 2019 from 192.168.4.254

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[root@host52 ~]#

[root@host52 ~]# exit //断开连接

登出

Connection to 192.168.4.52 closed.

[root@host51 ~]#

[root@host51 ~]# ssh root@192.168.4.53 //可以无密码连接52主机

Last login: Fri Jun 21 09:01:15 2019 from 192.168.4.254

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[root@host53 ~]# exit//断开连接

登出

Connection to 192.168.4.53 closed.

[root@host51 ~]#

2）配置数据库服务器192.168.4.52

[root@host52 ~]# ssh-keygen //创建秘钥对

Generating public/private rsa key pair.

Enter file in which to save the key (/root/.ssh/id\_rsa): //回车

Enter passphrase (empty for no passphrase): //回车

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:

SHA256:qb7EZByHad3Jadr+zkiEbo7ZKGmCNlctgp+Wfp3Yad0 root@pxcnode71

The key's randomart image is:

+---[RSA 2048]----+

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|. =+..B.o ..+ |

+----[SHA256]-----+

[root@host52 ~]#

[root@host52 ~]# ssh-copy-id root@192.168.4.51 //传递公钥给host51主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.51's password: //输入host51主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.51'"

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

[root@host52 ~]#

[root@host52 ~]# ssh-copy-id root@192.168.4.53 //传递公钥给host53主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.53's password: //输入host53主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.53'"

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

[root@host52 ~]#

[root@host52 ~]# ssh root@192.168.4.51 //可以无密码连接51主机

Last login: Fri Jun 21 13:21:39 2019 from 192.168.4.254

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[root@host51 ~]#

[root@host51 ~]# exit //断开连接

登出

Connection to 192.168.4.52 closed.

[root@host52 ~]#

[root@host52 ~]# ssh root@192.168.4.53 //可以无密码连接53主机

Last login: Fri Jun 21 09:01:15 2019 from 192.168.4.254

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[root@host53 ~]# exit//断开连接

登出

Connection to 192.168.4.53 closed.

[root@host52 ~]#

3）配置数据库服务器192.168.4.53

[root@host53 ~]# ssh-keygen //创建秘钥对

Generating public/private rsa key pair.

Enter file in which to save the key (/root/.ssh/id\_rsa): //回车

Enter passphrase (empty for no passphrase): //回车

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:

SHA256:qb7EZByHad3Jadr+zkiEbo7ZKGmCNlctgp+Wfp3Yad0 root@pxcnode71

The key's randomart image is:

+---[RSA 2048]----+

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| + o o |

| = o \* |

| o o \* |

| . = S o |

| . . \* + o |

| .. =.O \* + |

|.o.\*+= & o E |

|. =+..B.o ..+ |

+----[SHA256]-----+

[root@host53 ~]#

[root@host53 ~]# ssh-copy-id root@192.168.4.51 //传递公钥给host51主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.51's password: //输入host51主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.51'"

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

[root@host53 ~]#

[root@host53 ~]# ssh-copy-id root@192.168.4.52 //传递公钥给host52主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.52's password: //输入host52主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.52'"

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

[root@host53 ~]#

[root@host53 ~]# ssh root@192.168.4.51 //可以无密码连接51主机

Last login: Fri Jun 21 13:21:39 2019 from 192.168.4.254

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[root@host51 ~]#

[root@host51 ~]# exit //断开连接

登出

Connection to 192.168.4.51 closed.

[root@host53 ~]#

[root@host53 ~]# ssh root@192.168.4.52 //可以无密码连接52主机

Last login: Fri Jun 21 09:01:15 2019 from 192.168.4.254

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[root@host52 ~]# exit//断开连接

登出

Connection to 192.168.4.52 closed.

[root@host53 ~]#

4）配置管理服务器192.168.4.57

[root@mgm57 ~]# ssh-keygen //创建秘钥对

Generating public/private rsa key pair.

Enter file in which to save the key (/root/.ssh/id\_rsa): //回车

Enter passphrase (empty for no passphrase): //回车

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:

SHA256:qb7EZByHad3Jadr+zkiEbo7ZKGmCNlctgp+Wfp3Yad0 root@pxcnode71

The key's randomart image is:

+---[RSA 2048]----+

| |

| + o o |

| = o \* |

| o o \* |

| . = S o |

| . . \* + o |

| .. =.O \* + |

|.o.\*+= & o E |

|. =+..B.o ..+ |

+----[SHA256]-----+

[root@mgm57 ~]#

[root@mgm57 ~]# ssh-copy-id root@192.168.4.51 //传递公钥给host51主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.51's password: //输入host51主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.51'"

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

[root@mgm57 ~]#

[root@mgm57 ~]# ssh-copy-id root@192.168.4.52 //传递公钥给host52主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.52's password: //输入host52主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.52'"

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

[root@mgm57 ~]#

[root@mgm57 ~]# ssh-copy-id root@192.168.4.53 //传递公钥给host52主机

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id\_rsa.pub"

/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@192.168.4.53's password: //输入host53主机系统管理员root用户密码

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@192.168.4.53'"

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

[root@mgm57 ~]

[root@mgm57 ~]# ssh root@192.168.4.51 //可以无密码连接51主机

Last login: Fri Jun 21 13:21:39 2019 from 192.168.4.254

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[root@host51 ~]#

[root@host51 ~]# exit //断开连接

登出

Connection to 192.168.4.51 closed.

[root@mgm57 ~]#

[root@mgm57 ~]# ssh root@192.168.4.52 //可以无密码连接52主机

Last login: Fri Jun 21 09:01:15 2019 from 192.168.4.254

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[root@host52 ~]# exit//断开连接

登出

Connection to 192.168.4.52 closed.

[root@mgm57 ~]# ssh root@192.168.4.53 //可以无密码连接53主机

Last login: Fri Jun 21 09:01:15 2019 from 192.168.4.254

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[root@host53 ~]# exit//断开连接

登出

Connection to 192.168.4.53 closed.

步骤二： 安装依赖包

1）配置数据库服务器192.168.4.51

[root@host51 ~]# yum -y install perl-\* //安装系统自带的perl软件包

[root@host51 ~]# cd mha-soft-student

[root@host51 ~]# yum –y install perl-\* //安装共享的perl软件包

2）配置数据库服务器192.168.4.52

1. [root@host52 ~]# yum -y install perl-\* //安装系统自带的perl软件包
2. [root@host52 ~]# cd mha-soft-student
3. [root@host52 ~]# yum –y install perl-\* //安装共享的perl软件包[root@localhost

3）配置数据库服务器192.168.4.53

[root@host53 ~]# yum -y install perl-\* //安装系统自带的perl软件包

[root@host53 ~]# cd mha-soft-student

[root@host53 ~]# yum –y install perl-\* //安装共享的perl软件包

4）配置管理服务器192.168.4.57

[root@mgm57 ~]# yum -y install perl-\* //安装系统自带的perl软件包

[root@mgm57 ~]# cd mha-soft-student

[root@mgm57 ~]# yum –y install perl-\* //安装共享的perl软件包

步骤三： 配置MySQL一主多从结构

1）配置主服务器192.168.4.51

1. [root@host51 ~]# vim /etc/my.cnf
2. [mysqld]
3. log-bin=master51 //日志名
4. server\_id=51 //指定server\_id
5. :wq
6. [root@host51 ~]# systemctl restart mysqld
7. [root@host51 ~]# mysql -uroot -p123qqq…A
8. mysql> grant replication slave on \*.\* to repluser@"%" identified by “123qqq…A"; //添加从服务器同步数据连接用户
9. mysql> show master status; //查看日志信息
10. mysql: [Warning] Using a password on the command line interface can be insecure.
11. +-----------------+----------+--------------+------------------+-------------------+
12. | File | Position | Binlog\_Do\_DB | Binlog\_Ignore\_DB | Executed\_Gtid\_Set |
13. +-----------------+----------+--------------+------------------+-------------------+
14. | master51.000001 | 441 | | | |
15. +-----------------+----------+--------------+------------------+-------------------+
16. [root@host51 ~]#

2）配置从服务器192.168.4.52

[root@host52 ~]# vim /etc/my.cnf

[mysqld]

server\_id=52 //指定server\_id

:wq

[root@host52 ~]# systemctl restart mysqld //重启数据库服务

[root@host52 ~]# mysql -uroot –p123qqq…A //数据库管理员登录

mysql> change master to //指定主服务器信息

master\_host="192.168.4.51", //IP地址

master\_user="repluser", //授权用户

master\_password="123qqq...A", //授权用户密码

master\_log\_file="master51.000001", //binlog日志

master\_log\_pos=441; //偏移量

mysql> start slave; //启动slave进程

mysql> exit ; //断开连接

[root@host52 ~]# mysql -uroot –p123qqq…A –e “show slave status\G” | grep 192.168.4.51

Master\_Host: 192.168.4.51 //主服务器Ip地址

[root@host52 ~]# mysql -uroot –p123qqq…A –e “show slave status\G” | grep –i yes

Slave\_IO\_Running: Yes //I0线程正常

Slave\_SQL\_Running: Yes //SQL线程正常

3）配置从服务器192.168.4.53

[root@host53 ~]# vim /etc/my.cnf

[mysqld]

server\_id=53 //指定server\_id

:wq

[root@host53 ~]# systemctl restart mysqld //重启数据库服务

[root@host53 ~]# mysql -uroot –p123qqq…A //数据库管理员登录

mysql> change master to //指定主服务器信息

master\_host="192.168.4.51", //IP地址

master\_user="repluser", //授权用户

master\_password="123qqq...A", //授权用户密码

master\_log\_file="master51.000001", //binlog日志

master\_log\_pos=441; //偏移量

mysql> start slave; //启动slave进程

mysql> exit ; //断开连接

[root@host53 ~]# mysql -uroot –p123qqq…A –e “show slave status\G” | grep 192.168.4.51

Master\_Host: 192.168.4.51 //主服务器Ip地址

[root@host53 ~]# mysql -uroot –p123qqq…A –e “show slave status\G” | grep –i yes

Slave\_IO\_Running: Yes //I0线程正常

Slave\_SQL\_Running: Yes //SQL线程正常

**2 案例2：部署MHA集群**

**2.1 问题**

* 配置管理节点
* 配置数据节点

**2.2 步骤**

实现此案例需要按照如下步骤进行。

步骤一：配置管理节点

1）安装软件

1. [root@mgm57 ~]# cd mha-soft-student/
2. [root@mgm57 mha-soft-student]#
3. [root@mgm57 mha-soft-student]# rpm -ivh mha4mysql-node-0.56-0.el6.noarch.rpm//安装mha-node软件包
4. 准备中... ################################# [100%]
5. 正在升级/安装...
6. 1:mha4mysql-node-0.56-0.el6 ################################# [100%]
7. [root@mgm57 mha-soft-student]#
8. [root@mgm57 mha-soft-student]# rpm -qa | grep mha //查看是否安装成功
9. mha4mysql-node-0.56-0.el6.noarch
10. [root@mgm57 mha-soft-student]#
11. [root@mgm57 mha-soft-student]# tar -zxvf mha4mysql-manager-0.56.tar.gz //解压mha-manager软件包
12. mha4mysql-manager-0.56/
13. mha4mysql-manager-0.56/debian/
14. mha4mysql-manager-0.56/debian/control
15. mha4mysql-manager-0.56/debian/copyright
16. ……
17. ……
18. [root@mgm57 mha-soft-student]# ls
19. app1.cnf mha4mysql-manager-0.56
20. mha4mysql-node-0.56-0.el6.noarch.rpm
21. master\_ip\_failover mha4mysql-manager-0.56.tar.gz
22. [root@mgm57 mha-soft-student]# cd mha4mysql-manager-0.56 //进入源码目录
23. [root@mgm57 mha4mysql-manager-0.56]# ls //查看文件列表
24. AUTHORS COPYING inc Makefile.PL META.yml rpm t
25. bin debian lib MANIFEST README samples tests
26. [root@mgm57 mha4mysql-manager-0.56]#
27. [root@mgm57 mha4mysql-manager-0.56]# perl Makefile.PL //配置
28. \*\*\* Module::AutoInstall version 1.03
29. \*\*\* Checking for Perl dependencies...
30. [Core Features]
31. - DBI ...loaded. (1.627)
32. - DBD::mysql ...loaded. (4.023)
33. - Time::HiRes ...loaded. (1.9725)
34. - Config::Tiny ...loaded. (2.14)
35. - Log::Dispatch ...loaded. (2.41)
36. - Parallel::ForkManager ...loaded. (1.18)
37. - MHA::NodeConst ...loaded. (0.56)
38. \*\*\* Module::AutoInstall configuration finished.
39. Checking if your kit is complete...
40. Looks good
41. Writing Makefile for mha4mysql::manager
42. Writing MYMETA.yml and MYMETA.json
43. [root@mgm57 mha4mysql-manager-0.56]# make //编译
44. [root@mgm57 mha4mysql-manager-0.56]# make install //安装
45. [root@mgm57 mha4mysql-manager-0.56]# ls /root/perl5/bin //查看安装的命令
46. masterha\_check\_repl masterha\_conf\_host masterha\_master\_switch
47. masterha\_check\_ssh masterha\_manager masterha\_secondary\_check
48. masterha\_check\_status masterha\_master\_monitor masterha\_stop

2）编辑主配置文件

1. [root@mgm57 ~ ]# mkdir /etc/mha //创建工作目录
2. [root@mgm57 ~ ]# cp mha4mysql-manager-0.56/sample/conf/app1.cnf /etc/mha/ //拷贝模板文件
3. [root@mgm57 ~ ]# vim /etc/mha/app1.cnf //编辑主配置文件
4. [server default] //管理服务默认配置
5. manager\_workdir=/etc/mha //工作目录
6. manager\_log=/etc/mha/manager.log //日志文件
7. master\_ip\_failover\_script=/etc/mha/master\_ip\_failover //故障切换脚本
8. ssh\_user=root //访问ssh服务用户
9. ssh\_port=22 //ssh服务端口
10. repl\_user=repluser      //主服务器数据同步授权用户
11. repl\_password=123qqq…A //密码
12. user=root          //监控用户
13. password=123qqq…A      //密码
14. [server1] //指定第1台数据库服务器
15. hostname=192.168.4.51    //服务器ip地址
16. port=3306                //服务端口
17. candidate\_master=1             //竞选主服务器
18. [server2] //指定第2台数据库服务器
19. hostname=192.168.4.52
20. port=3306
21. candidate\_master=1
23. [server3] //指定第3台数据库服务器
24. hostname=192.168.4.53
25. port=3306
26. candidate\_master=1
27. :wq

3）创建故障切换脚本

1. [root@mgm57 ~]# cp mha-soft-student/master\_ip\_failover /etc/mha/
2. [root@mgm57 ~]# vim +35 /etc/mha/master\_ip\_failover
3. my $vip = '192.168.4.100/24'; # Virtual IP //定义VIP地址
4. my $key = "1"; //定义变量$key
5. my $ssh\_start\_vip = "/sbin/ifconfig eth0:$key $vip"; //部署vip地址命令
6. my $ssh\_stop\_vip = "/sbin/ifconfig eth0:$key down"; //释放vip地址命令
7. :wq
8. [root@mgm57 ~]# chmod +x /etc/mha/master\_ip\_failover //给脚本加执行权限

4）在当前主服务器部署vip地址

1. [root@host51 ~]# ifconfig eth0:1 //部署之前查看
2. eth0:1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
3. ether 52:54:00:d8:10:d7 txqueuelen 1000 (Ethernet)
4. [root@host51 ~]# ifconfig eth0:1 192.168.4.100 //部署vip地址
5. [root@host51 ~]# ifconfig eth0:1 //部署后查看
6. eth0:1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
7. inet 192.168.4.100 netmask 255.255.255.0 broadcast 192.168.4.255
8. ether 52:54:00:d8:10:d7 txqueuelen 1000 (Ethernet)

步骤二：配置数据节点

1）在所有数据库服务器上，安装mha-node软件包

1. ]# cd /root/mha-soft-student/
2. ]# rpm -ivh mha4mysql-node-0.56-0.el6.noarch.rpm
3. 准备中... ################################# [100%]
4. 正在升级/安装...
5. 1:mha4mysql-node-0.56-0.el6 ################################# [100%]

2）在所有数据服务器上添加监控用户

可以只在host51主机执行授权命令，host52和host53 会自动同步授权

1. ]# mysql –uroot –p密码
2. mysql> grant all on \*.\* to root@"%" identified by "123qqq...A";
3. mysql> exit;

3）在2台从服务器上添加，数据同步连接用户

在从服务器host52添加用户

1. [root@host52]# mysql –uroot –p密码
2. mysql> grant replication slave on \*.\* to repluser@"%" identified by "123qqq...A";
3. mysql> exit;

在从服务器host53添加用户

1. [root@host53]# mysql –uroot –p密码
2. mysql> grant replication slave on \*.\* to repluser@"%" identified by "123qqq...A";
3. mysql> exit;

4）修改数据库服务运行参数

修改主服务器host51

1. [root@host51 ~]# vim /etc/my.cnf
2. [mysqld]
3. plugin-load="rpl\_semi\_sync\_master=semisync\_master.so;rpl\_semi\_sync\_slave=semisync\_slave.so" //加载模块
4. rpl\_semi\_sync\_master\_enabled=1 //启用master模块
5. rpl\_semi\_sync\_slave\_enabled=1 //启用slave模块
6. relay\_log\_purge=0 //禁止自动删除中继日志文件
7. :wq
8. [root@host51 ~]# systemctl restart mysqld //重启服务

修改从服务器host52

1. [root@host52 ~]# vim /etc/my.cnf
2. [mysqld]
3. log-bin=master52
4. plugin-load="rpl\_semi\_sync\_master=semisync\_master.so;rpl\_semi\_sync\_slave=semisync\_slave.so" //加载模块
5. rpl\_semi\_sync\_master\_enabled=1 //启用master模块
6. rpl\_semi\_sync\_slave\_enabled=1 //启用slave模块
7. relay\_log\_purge=0 //禁止自动删除中继日志文件
8. :wq
9. [root@host52 ~]# systemctl restart mysqld //重启服务

修改从服务器host53

[root@host53 ~]# vim /etc/my.cnf

[mysqld]

log-bin=master53

plugin-load="rpl\_semi\_sync\_master=semisync\_master.so;rpl\_semi\_sync\_slave=semisync\_slave.so" //加载模块

rpl\_semi\_sync\_master\_enabled=1 //启用master模块

rpl\_semi\_sync\_slave\_enabled=1 //启用slave模块

relay\_log\_purge=0 //禁止自动删除中继日志文件

:wq

[root@host53 ~]# systemctl restart mysqld //重启服务

**3 案例3：测试配置**

**3.1 问题**

* 测试集群环境
* 访问集群
* 测试高可用
* 修复故障服务器

**3.2 步骤**

实现此案例需要按照如下步骤进行。

步骤一：测试集群环境

1）在管理主机，测试ssh配置

1. [root@mgm57 ~]# masterha\_check\_ssh --conf=/etc/mha/app1.cnf //执行测试命令
2. Thu Jun 20 15:33:48 2019 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.
3. Thu Jun 20 15:33:48 2019 - [info] Reading application default configuration from /etc/mha/app1.cnf..
4. Thu Jun 20 15:33:48 2019 - [info] Reading server configuration from /etc/mha/app1.cnf..
5. Thu Jun 20 15:33:48 2019 - [info] Starting SSH connection tests..
6. Thu Jun 20 15:33:49 2019 - [debug]
7. Thu Jun 20 15:33:48 2019 - [debug] Connecting via SSH from root@192.168.4.51(192.168.4.51:22) to root@192.168.4.52(192.168.4.52:22)..
8. Thu Jun 20 15:33:49 2019 - [debug] ok.
9. Thu Jun 20 15:33:49 2019 - [debug] Connecting via SSH from root@192.168.4.51(192.168.4.51:22) to root@192.168.4.53(192.168.4.53:22)..
10. Thu Jun 20 15:33:49 2019 - [debug] ok.
11. Thu Jun 20 15:33:50 2019 - [debug]
12. Thu Jun 20 15:33:49 2019 - [debug] Connecting via SSH from root@192.168.4.52(192.168.4.52:22) to root@192.168.4.51(192.168.4.51:22)..
13. Thu Jun 20 15:33:49 2019 - [debug] ok.
14. Thu Jun 20 15:33:49 2019 - [debug] Connecting via SSH from root@192.168.4.52(192.168.4.52:22) to root@192.168.4.53(192.168.4.53:22)..
15. Thu Jun 20 15:33:49 2019 - [debug] ok.
16. Thu Jun 20 15:33:50 2019 - [debug] ok.
17. Thu Jun 20 15:33:50 2019 - [debug] Connecting via SSH from root@192.168.4.53(192.168.4.53:22) to root@192.168.4.52(192.168.4.52:22)..
18. Thu Jun 20 15:33:50 2019 - [debug] ok.
19. Thu Jun 20 15:33:51 2019 - [info] All SSH connection tests passed successfully.//测试成功提示

2）在管理主机，测试主从同步

1. [root@host57 ~]# masterha\_check\_repl --conf=/etc/mha/app1.cnf //执行测试命令
2. Thu Jun 20 15:37:46 2019 - [info] Reading server configuration from /etc/mha/app1.cnf..
3. Thu Jun 20 15:37:46 2019 - [info] MHA::MasterMonitor version 0.56.
4. Thu Jun 20 15:37:47 2019 - [info] GTID failover mode = 0
5. Thu Jun 20 15:37:47 2019 - [info] Dead Servers: //没有停止的mysql服务器
6. Thu Jun 20 15:37:47 2019 - [info] Alive Servers://运行mysql服务主机列表
7. Thu Jun 20 15:37:47 2019 - [info] 192.168.4.51(192.168.4.51:3306)
8. Thu Jun 20 15:37:47 2019 - [info] 192.168.4.52(192.168.4.52:3306)
9. Thu Jun 20 15:37:47 2019 - [info] 192.168.4.53(192.168.4.53:3306)
10. Thu Jun 20 15:37:47 2019 - [info] Alive Slaves:
11. Thu Jun 20 15:37:47 2019 - [info] Primary candidate for the new Master (candidate\_master is set)
12. Thu Jun 20 15:37:47 2019 - [info] 192.168.4.53(192.168.4.53:3306) Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
13. Thu Jun 20 15:37:47 2019 - [info] Replicating from 192.168.4.51(192.168.4.51:3306)
14. Thu Jun 20 15:37:47 2019 - [info] Primary candidate for the new Master (candidate\_master is set)
15. Thu Jun 20 15:37:47 2019 - [info] Current Alive Master: 192.168.4.51(192.168.4.51:3306)
16. Thu Jun 20 15:37:47 2019 - [info] Checking slave configurations..
17. Thu Jun 20 15:37:47 2019 - [info] read\_only=1 is not set on slave 192.168.4.52(192.168.4.52:3306).
18. Thu Jun 20 15:37:47 2019 - [info] read\_only=1 is not set on slave 192.168.4.53(192.168.4.53:3306).
19. Thu Jun 20 15:37:47 2019 - [info] Checking replication filtering settings..
20. Thu Jun 20 15:37:47 2019 - [info] binlog\_do\_db= , binlog\_ignore\_db=
21. Thu Jun 20 15:37:47 2019 - [info] Replication filtering check ok.
22. Thu Jun 20 15:37:47 2019 - [info] GTID (with auto-pos) is not supported
23. Thu Jun 20 15:37:47 2019 - [info] Starting SSH connection tests..
24. Thu Jun 20 15:37:49 2019 - [info] All SSH connection tests passed successfully.
25. Thu Jun 20 15:37:49 2019 - [info] Checking MHA Node version..
26. Thu Jun 20 15:37:50 2019 - [info] Version check ok.
27. Thu Jun 20 15:37:50 2019 - [info] Checking SSH publickey authentication settings on the current master..
28. Thu Jun 20 15:37:50 2019 - [info] HealthCheck: SSH to 192.168.4.51 is reachable.
29. Thu Jun 20 15:37:50 2019 - [info] Master MHA Node version is 0.56.
30. Thu Jun 20 15:37:50 2019 - [info] Checking recovery script configurations on 192.168.4.51(192.168.4.51:3306)..
31. Thu Jun 20 15:37:50 2019 - [info] Connecting to root@192.168.4.51(192.168.4.51:22)..
32. Creating /var/tmp if not exists.. ok.
33. Checking output directory is accessible or not..
34. ok.
35. Binlog found at /var/lib/mysql, up to master51.000002
36. Thu Jun 20 15:37:50 2019 - [info] Binlog setting check done.
37. Thu Jun 20 15:37:50 2019 - [info] Checking SSH publickey authentication and checking recovery script configurations on all alive slave servers..
38. Thu Jun 20 15:37:50 2019 - [info] Connecting to root@192.168.4.52(192.168.4.52:22)..
39. Checking slave recovery environment settings..
40. Opening /var/lib/mysql/relay-log.info ... ok.
41. Relay log found at /var/lib/mysql, up to host52-relay-bin.000006
42. Temporary relay log file is /var/lib/mysql/host52-relay-bin.000006
43. Testing mysql connection and privileges..mysql: [Warning] Using a password on the command line interface can be insecure.
44. done.
45. Testing mysqlbinlog output.. done.
46. Cleaning up test file(s).. done.
47. Thu Jun 20 15:37:51 2019 - [info] Executing command : apply\_diff\_relay\_logs --command=test --slave\_user='root' --slave\_host=192.168.4.53 --slave\_ip=192.168.4.53 --slave\_port=3306 --workdir=/var/tmp --target\_version=5.7.17-log --manager\_version=0.56 --relay\_log\_info=/var/lib/mysql/relay-log.info --relay\_dir=/var/lib/mysql/ --slave\_pass=xxx
48. Thu Jun 20 15:37:51 2019 - [info] Connecting to root@192.168.4.53(192.168.4.53:22)..
49. Checking slave recovery environment settings..
50. Opening /var/lib/mysql/relay-log.info ... ok.
51. Relay log found at /var/lib/mysql, up to host53-relay-bin.000006
52. Temporary relay log file is /var/lib/mysql/host53-relay-bin.000006
53. Testing mysql connection and privileges..mysql: [Warning] Using a password on the command line interface can be insecure.
54. done.
55. Testing mysqlbinlog output.. done.
56. Cleaning up test file(s).. done.
57. Thu Jun 20 15:37:52 2019 - [info] Slaves settings check done.
58. Thu Jun 20 15:37:52 2019 - [info]
59. 192.168.4.51(192.168.4.51:3306) (current master)
60. +--192.168.4.52(192.168.4.52:3306)
61. +--192.168.4.53(192.168.4.53:3306)
62. Thu Jun 20 15:37:52 2019 - [info] Checking replication health on 192.168.4.52..
63. Thu Jun 20 15:37:52 2019 - [info] ok.
64. Thu Jun 20 15:37:52 2019 - [info] Checking replication health on 192.168.4.53..
65. Thu Jun 20 15:37:52 2019 - [info] ok.
66. Thu Jun 20 15:37:52 2019 - [info] Checking master\_ip\_failover\_script status:
67. Thu Jun 20 15:37:52 2019 - [info] /etc/mha/master\_ip\_failover --command=status --ssh\_user=root --orig\_master\_host=192.168.4.51 --orig\_master\_ip=192.168.4.51 --orig\_master\_port=3306
68. Thu Jun 20 15:37:52 2019 - [info] OK.
69. Thu Jun 20 15:37:52 2019 - [warning] shutdown\_script is not defined.
70. Thu Jun 20 15:37:52 2019 - [info] Got exit code 0 (Not master dead).
71. MySQL Replication Health is OK.//测试成功提示信息

3）启动管理服务

1. [root@mgm57 ~]# masterha\_manager --conf=/etc/mha/app1.cnf --remove\_dead\_master\_conf \
2. --ignore\_last\_failover //执行启动命令
3. Thu Jun 20 17:05:58 2019 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.
4. Thu Jun 20 17:05:58 2019 - [info] Reading application default configuration from /etc/mha/app1.cnf..
5. Thu Jun 20 17:05:58 2019 - [info] Reading server configuration from /etc/mha/app1.cnf..

4）查看服务状态

1. [root@mgm57 ~]# masterha\_check\_status --conf=/etc/mha/app1.cnf//执行命令
2. app1 (pid:15806) is running(0:PING\_OK), master:192.168.4.51 //服务运行，监视主服务器192.168.4.51
3. [root@mgm57 ~]# ls /etc/mha/ //查看工作目录文件列表
4. app1.cnf app1.master\_status.health manager.log master\_ip\_failover

步骤二：访问集群

1）在主服务器51 添加访问数据的连接用户

1. ]# mysql -uroot -p123qqq...A
2. mysql> create database db9;
3. Query OK, 1 row affected (0.05 sec)
4. mysql> create table db9.a (id int);
5. Query OK, 0 rows affected (0.63 sec)
6. mysql> grant select,insert on db9.\* to yaya55@"%" identified by "123qqq...A";
7. Query OK, 0 rows affected, 1 warning (0.08 sec)
8. mysql>exit

2）客户端50 连接vip地址访问集群

1. host50~]# mysql -h192.168.4.100 -uyaya55 -p123qqq...A
2. mysql> select \* from db9.a;
3. mysql> insert into db9.a values(100);
4. mysql> select \* from db9.a;
5. +------+
6. | id |
7. +------+
8. | 100 |
9. +------+
10. 1 row in set (0.00 sec)
11. mysql>exit

3）在从服务器host52 查看数据

1. [root@host52 ~]# mysql -uroot -p123qqq...A -e "select \* from db9.a"
2. mysql: [Warning] Using a password on the command line interface can be insecure.
3. +------+
4. | id |
5. +------+
6. | 100 |
7. +------+

4）在从服务器host53 查看数据

1. [root@host53 ~]# mysql -uroot -p123qqq...A -e "select \* from db9.a"
2. mysql: [Warning] Using a password on the command line interface can be insecure.
3. +------+
4. | id |
5. +------+
6. | 100 |
7. +------+

步骤三：测试高可用

1）停止主服务器51的mysql服务

1. host51~]# systemctl stop mysqld

2）查看管理服务 ，输出的监控信息

1. [root@mgm57~]#masterha\_manager --conf=/etc/mha/app1.cnf --remove\_dead\_master\_conf \
2. > --ignore\_last\_failover
3. Thu Jun 20 17:05:58 2019 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.
4. Thu Jun 20 17:05:58 2019 - [info] Reading application default configuration from /etc/mha/app1.cnf..
5. Thu Jun 20 17:05:58 2019 - [info] Reading server configuration from /etc/mha/app1.cnf..
6. Creating /var/tmp if not exists.. ok.
7. Checking output directory is accessible or not..
8. ok.
9. Binlog found at /var/lib/mysql, up to master51.000002
10. Thu Jun 20 17:35:59 2019 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.
11. Thu Jun 20 17:35:59 2019 - [info] Reading application default configuration from /etc/mha/app1.cnf..
12. Thu Jun 20 17:35:59 2019 - [info] Reading server configuration from /etc/mha/app1.cnf..
13. [root@host57 ~]#
14. [root@mgm57 ~]# masterha\_check\_status --conf=/etc/mha/app1.cnf
15. app1 is stopped(2:NOT\_RUNNING). //监控到主服务器宕机 管理服务自动停止
16. [root@mgm57 ~]#

3）客户端依然连接vip地址，可以访问到数据

1. client50]# ping -c 2 192.168.4.100 //能够ping通vip地址
2. PING 192.168.4.100 (192.168.4.100) 56(84) bytes of data.
3. 64 bytes from 192.168.4.100: icmp\_seq=1 ttl=255 time=0.222 ms
4. 64 bytes from 192.168.4.100: icmp\_seq=2 ttl=255 time=0.121 ms
5. --- 192.168.4.71 ping statistics ---
6. 2 packets transmitted, 2 received, 0% packet loss, time 999ms
7. rtt min/avg/max/mdev = 0.121/0.171/0.222/0.052 ms
8. client50]# mysql -h192.168.4.100 -uyaya55 -p123qqq...A //连接vip地址
9. mysql> insert into db9.a values(200); //插入记录
10. mysql> select \* from db9.a;//查询记录
11. +------+
12. | id |
13. +------+
14. | 100 |
15. | 200 |
16. +------+

4）查看vip地址

在host52主机查看到vip地址，说明host52 主机被选举为主服务器

1. [root@host52 ~]# ifconfig eth0:1
2. eth0:1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
3. inet 192.168.4.100 netmask 255.255.255.0 broadcast 192.168.4.255
4. ether 52:54:00:f5:c4:6a txqueuelen 1000 (Ethernet)

在host53主机未查看到vip地址，说明host53主机是当前host52的从服务器

1. [root@host53 ~]# ifconfig eth0:1 //未查到vip地址
2. eth0:1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
3. ether 52:54:00:28:22:2e txqueuelen 1000 (Ethernet)
4. [root@host53 ~]# mysql -uroot -p123qqq...A -e "show slave status\G" | grep -i 192
5. mysql: [Warning] Using a password on the command line interface can be insecure.
6. Master\_Host: 192.168.4.52 //主服务器Ip地址
7. [root@host53 ~]#
8. [root@host53 ~]# mysql -uroot -p123qqq...A -e "show slave status\G" | grep -i yes
9. mysql: [Warning] Using a password on the command line interface can be insecure.
10. Slave\_IO\_Running: Yes //IO线程正常
11. Slave\_SQL\_Running: Yes //SQL线程正常
12. [root@host53 ~]# mysql -uroot -p123qqq...A -e "select \* from db9.a" //自动同步数据
13. mysql: [Warning] Using a password on the command line interface can be insecure.
14. +------+
15. | id |
16. +------+
17. | 100 |
18. | 200 |
19. +------+

步骤四：修复故障服务器

1）配置数据库服务器

启动host51主机的数据库服务

1. host51~]# systemctl start mysqld

与主服务器数据一致

1. [root@host52 ~]# mysqldump -uroot -p123qqq...A --master-data db9 > db9.sql //在主服务器host52 做完全备份
2. mysqldump: [Warning] Using a password on the command line interface can be insecure.
3. [root@host52 ~]#
4. [root@host52 ~]# scp db9.sql root@192.168.4.51:/root/ //拷贝备份文件给host51主机
5. db9.sql 100% 1918 3.1MB/s 00:00
6. [root@host52 ~]#
7. host51 ~]# mysql -uroot -p123qqq...A db9 < /root/db9.sql//host51 主机使用备份文件恢复数据
8. mysql: [Warning] Using a password on the command line interface can be insecure.

指定主服务器信息

1. [root@host51 ~]# grep master52 /root/db9.sql //查看日志名及偏移量
2. CHANGE MASTER TO MASTER\_LOG\_FILE='master52.000001', MASTER\_LOG\_POS=895;
3. [root@host51 ~]# mysql -uroot -p123qqq...A
4. mysql>change master to master\_host="192.168.4.52",master\_user="repluser",master\_password="123qqq...A",master\_log\_file="master52.000001",master\_log\_pos=895;
5. Query OK, 0 rows affected, 2 warnings (0.14 sec)

启动slave进程

1. mysql> start slave;
2. Query OK, 0 rows affected (0.01 sec)
3. Mysql> exit ;

查看状态信息

1. [root@host51 ~]# mysql -uroot -p123qqq...A -e "show slave status\G" |grep 192.168.4.52
2. mysql: [Warning] Using a password on the command line interface can be insecure.
3. Master\_Host: 192.168.4.52 //主服务器ip地址
4. [root@host51 ~]#
5. [root@host51 ~]# mysql -uroot -p123qqq...A -e "show slave status\G" |grep -i yes
6. mysql: [Warning] Using a password on the command line interface can be insecure.
7. Slave\_IO\_Running: Yes //IO线程状态正常
8. Slave\_SQL\_Running: Yes //SQL线程状态正常
9. [root@host51 ~]#

2）配置管理服务器

修改配置文件，添加数据库服务器host51

1. ]# vim /etc/mha/app1.cnf
2. [server1 ]
3. hostname=192.168.4.51
4. port=3306
5. candidate\_master=1
6. :wq

测试集群环境

1. [root@mgm57 ~]# masterha\_check\_ssh --conf=/etc/mha/app1.cnf //测试SSH
2. Thu Jun 20 15:33:48 2019 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.
3. Thu Jun 20 15:33:48 2019 - [info] Reading application default configuration from /etc/mha/app1.cnf..
4. Thu Jun 20 15:33:48 2019 - [info] Reading server configuration from /etc/mha/app1.cnf..
5. Thu Jun 20 15:33:48 2019 - [info] Starting SSH connection tests..
6. Thu Jun 20 15:33:49 2019 - [debug]
7. Thu Jun 20 15:33:48 2019 - [debug] Connecting via SSH from root@192.168.4.51(192.168.4.51:22) to root@192.168.4.52(192.168.4.52:22)..
8. Thu Jun 20 15:33:49 2019 - [debug] ok.
9. Thu Jun 20 15:33:49 2019 - [debug] Connecting via SSH from root@192.168.4.51(192.168.4.51:22) to root@192.168.4.53(192.168.4.53:22)..
10. Thu Jun 20 15:33:49 2019 - [debug] ok.
11. Thu Jun 20 15:33:50 2019 - [debug]
12. Thu Jun 20 15:33:49 2019 - [debug] Connecting via SSH from root@192.168.4.52(192.168.4.52:22) to root@192.168.4.51(192.168.4.51:22)..
13. Thu Jun 20 15:33:49 2019 - [debug] ok.
14. Thu Jun 20 15:33:49 2019 - [debug] Connecting via SSH from root@192.168.4.52(192.168.4.52:22) to root@192.168.4.53(192.168.4.53:22)..
15. Thu Jun 20 15:33:49 2019 - [debug] ok.
16. Thu Jun 20 15:33:50 2019 - [debug] ok.
17. Thu Jun 20 15:33:50 2019 - [debug] Connecting via SSH from root@192.168.4.53(192.168.4.53:22) to root@192.168.4.52(192.168.4.52:22)..
18. Thu Jun 20 15:33:50 2019 - [debug] ok.
19. Thu Jun 20 15:33:51 2019 - [info] All SSH connection tests passed successfully.//成功
20. [root@mgm57 ~]# masterha\_check\_repl --conf=/etc/mha/app1.cnf//测试主从同步
21. Thu Jun 20 15:37:46 2019 - [info] Reading server configuration from /etc/mha/app1.cnf..
22. Thu Jun 20 15:37:46 2019 - [info] MHA::MasterMonitor version 0.56.
23. Thu Jun 20 15:37:47 2019 - [info] GTID failover mode = 0
24. Thu Jun 20 15:37:47 2019 - [info] Dead Servers:
25. Thu Jun 20 15:37:47 2019 - [info] Alive Servers:
26. Thu Jun 20 15:37:47 2019 - [info] 192.168.4.51(192.168.4.51:3306)
27. Thu Jun 20 15:37:47 2019 - [info] 192.168.4.52(192.168.4.52:3306)
28. Thu Jun 20 15:37:47 2019 - [info] 192.168.4.53(192.168.4.53:3306)
29. Thu Jun 20 15:37:47 2019 - [info] Alive Slaves:
30. Thu Jun 20 15:37:47 2019 - [info] Primary candidate for the new Master (candidate\_master is set)
31. Thu Jun 20 15:37:47 2019 - [info] 192.168.4.53(192.168.4.53:3306) Version=5.7.17-log (oldest major version between slaves) log-bin:enabled
32. Thu Jun 20 15:37:47 2019 - [info] Replicating from 192.168.4.51(192.168.4.51:3306)
33. Thu Jun 20 15:37:47 2019 - [info] Primary candidate for the new Master (candidate\_master is set)
34. Thu Jun 20 15:37:47 2019 - [info] Current Alive Master: 192.168.4.51(192.168.4.51:3306)
35. Thu Jun 20 15:37:47 2019 - [info] Checking slave configurations..
36. Thu Jun 20 15:37:47 2019 - [info] read\_only=1 is not set on slave 192.168.4.52(192.168.4.52:3306).
37. Thu Jun 20 15:37:47 2019 - [info] read\_only=1 is not set on slave 192.168.4.53(192.168.4.53:3306).
38. Thu Jun 20 15:37:47 2019 - [info] Checking replication filtering settings..
39. Thu Jun 20 15:37:47 2019 - [info] binlog\_do\_db= , binlog\_ignore\_db=
40. Thu Jun 20 15:37:47 2019 - [info] Replication filtering check ok.
41. Thu Jun 20 15:37:47 2019 - [info] GTID (with auto-pos) is not supported
42. Thu Jun 20 15:37:47 2019 - [info] Starting SSH connection tests..
43. Thu Jun 20 15:37:49 2019 - [info] All SSH connection tests passed successfully.
44. Thu Jun 20 15:37:49 2019 - [info] Checking MHA Node version..
45. Thu Jun 20 15:37:50 2019 - [info] Version check ok.
46. Thu Jun 20 15:37:50 2019 - [info] Checking SSH publickey authentication settings on the current master..
47. Thu Jun 20 15:37:50 2019 - [info] HealthCheck: SSH to 192.168.4.51 is reachable.
48. Thu Jun 20 15:37:50 2019 - [info] Master MHA Node version is 0.56.
49. Thu Jun 20 15:37:50 2019 - [info] Checking recovery script configurations on 192.168.4.51(192.168.4.51:3306)..
50. Thu Jun 20 15:37:50 2019 - [info] Connecting to root@192.168.4.51(192.168.4.51:22)..
51. Creating /var/tmp if not exists.. ok.
52. Checking output directory is accessible or not..
53. ok.
54. Binlog found at /var/lib/mysql, up to master51.000002
55. Thu Jun 20 15:37:50 2019 - [info] Binlog setting check done.
56. Thu Jun 20 15:37:50 2019 - [info] Checking SSH publickey authentication and checking recovery script configurations on all alive slave servers..
57. Thu Jun 20 15:37:50 2019 - [info] Connecting to root@192.168.4.52(192.168.4.52:22)..
58. Checking slave recovery environment settings..
59. Opening /var/lib/mysql/relay-log.info ... ok.
60. Relay log found at /var/lib/mysql, up to host52-relay-bin.000006
61. Temporary relay log file is /var/lib/mysql/host52-relay-bin.000006
62. Testing mysql connection and privileges..mysql: [Warning] Using a password on the command line interface can be insecure.
63. done.
64. Testing mysqlbinlog output.. done.
65. Cleaning up test file(s).. done.
66. Thu Jun 20 15:37:51 2019 - [info] Connecting to root@192.168.4.53(192.168.4.53:22)..
67. Checking slave recovery environment settings..
68. Opening /var/lib/mysql/relay-log.info ... ok.
69. Relay log found at /var/lib/mysql, up to host53-relay-bin.000006
70. Temporary relay log file is /var/lib/mysql/host53-relay-bin.000006
71. Testing mysql connection and privileges..mysql: [Warning] Using a password on the command line interface can be insecure.
72. done.
73. Testing mysqlbinlog output.. done.
74. Cleaning up test file(s).. done.
75. Thu Jun 20 15:37:52 2019 - [info] Slaves settings check done.
76. Thu Jun 20 15:37:52 2019 - [info]
77. 192.168.4.51(192.168.4.51:3306) (current master)
78. +--192.168.4.52(192.168.4.52:3306)
79. +--192.168.4.53(192.168.4.53:3306)
80. Thu Jun 20 15:37:52 2019 - [info] Checking replication health on 192.168.4.52..
81. Thu Jun 20 15:37:52 2019 - [info] ok.
82. Thu Jun 20 15:37:52 2019 - [info] Checking replication health on 192.168.4.53..
83. Thu Jun 20 15:37:52 2019 - [info] ok.
84. Thu Jun 20 15:37:52 2019 - [info] Checking master\_ip\_failover\_script status:
85. Thu Jun 20 15:37:52 2019 - [info] /etc/mha/master\_ip\_failover --command=status --ssh\_user=root --orig\_master\_host=192.168.4.51 --orig\_master\_ip=192.168.4.51 --orig\_master\_port=3306
86. Thu Jun 20 15:37:52 2019 - [info] OK.
87. Thu Jun 20 15:37:52 2019 - [warning] shutdown\_script is not defined.
88. Thu Jun 20 15:37:52 2019 - [info] Got exit code 0 (Not master dead).
89. MySQL Replication Health is OK. //成功

重启管理服务

1. ]# masterha\_stop --conf=/etc/mha/app1.cnf //停止管理服务
2. Stopped app1 successfully.
3. ]# masterha\_manager --conf=/etc/mha/app1.cnf --remove\_dead\_master\_conf \
4. --ignore\_last\_failover //启动管理服务
5. Thu Jun 20 17:05:58 2019 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.
6. Thu Jun 20 17:05:58 2019 - [info] Reading application default configuration from /etc/mha/app1.cnf..
7. Thu Jun 20 17:05:58 2019 - [info] Reading server configuration from /etc/mha/app1.cnf..

查看状态

1. mgm57 ~]# masterha\_check\_status --conf=/etc/mha/app1.cnf
2. app1 (pid:15806) is running(0:PING\_OK), master:192.168.4.52 //服务运行，监视服务器52
3. [root@mgm57 ~]#