**MySQL高可用方案之MHA**

MHA分管理节点和数据库节点，数据库节点由mysql主从或者主主从构成，当主库挂掉后，管理节点会自动将从节点提升为主节点；管理节点的角色类似于oracle数据库中的fast start failover中的observer，但mha上层可以通过keepalive部署VIP，程序连接数据库使用VIP，从而实现后台数据库的故障切换透明化

MHA节点包含三个脚本，依赖perl模块；  
save\_binary\_logs:保存和复制当掉的主服务器二进制日志；  
apply\_diff\_relay\_logs:识别差异的relay log事件，并应用于其他salve服务器；  
purge\_relay\_logs:清除relay log文件；  
需要在所有mysql服务器上安装MHA节点，MHA管理服务器也需要安装。MHA管理节点模块内部依赖MHA节点模块；  
MHA管理节点通过ssh连接管理mysql服务器和执行MHA节点脚本。MHA节点依赖perl的DBD::mysql模块;

本文环境介绍，操作系统均为rhel5.4  
主库：192.168.123.13/dg53.yang.com  
备库：192.168.123.14/dg54.yang.com  
管理节点：192.168.123.15/dg55.yang.com

在开始之前，请先配置好服务器间的时间同步和名称解析

一:在数据库节点安装mha node

1. [root@dg53 ~]# rpm -ivh http://dl.fedoraproject.org/pub/epel/5/i386/epel-release-5-4.noarch.rpm
2. Retrieving http://dl.fedoraproject.org/pub/epel/5/i386/epel-release-5-4.noarch.rpm
3. warning: /var/tmp/rpm-xfer.yqwfYT: Header V3 DSA signature: NOKEY, key ID 217521f6
4. Preparing...                ########################################### [100%]
5. 1:epel-release           ########################################### [100%]
7. [root@dg53 ~]# ls /etc/yum.repos.d/
8. base.repo  epel.repo  epel-testing.repo  rhel-debuginfo.repo
9. [root@dg53 ~]# yum -y install perl-DBD-MySQL  ncftp
10. [root@dg53 ~]#  wget http://mysql-master-ha.googlecode.com/files/mha4mysql-node-0.52.tar.gz -P /usr/local/src/tarbag/
11. [root@dg53 ~]# cd /usr/local/src/tarbag/
12. [root@dg53 tarbag]# tar -zxvpf mha4mysql-node-0.52.tar.gz -C ../software/
13. [root@dg53 tarbag]# cd ../software/mha4mysql-node-0.52/
14. [root@dg53 mha4mysql-node-0.52]# perl Makefile.PL
15. [root@dg53 mha4mysql-node-0.52]# make && make install

二：管理节点  
1：按照步骤一安装mha node

2:安装mha manager

1. [root@dg55 ~]# yum -y install perl-Config-Tiny perl-Params-Validate perl-Log-Dispatch perl-Parallel-ForkManager
2. [root@dg55 ~]# wget http://mysql-master-ha.googlecode.com/files/mha4mysql-manager-0.52.tar.gz -P /usr/local/src/tarbag/
3. [root@dg55 ~]# cd /usr/local/src/tarbag/
4. [root@dg55 tarbag]# tar -zxvpf mha4mysql-manager-0.52.tar.gz -C ../software/
5. [root@dg55 tarbag]# cd ../software/mha4mysql-manager-0.52/
6. [root@dg55 mha4mysql-manager-0.52]# perl Makefile.PL
7. [root@dg55 mha4mysql-manager-0.52]# make && make install

3:编辑配置文件

1. [root@dg55 mha4mysql-manager-0.52]# mkdir /etc/masterha
2. [root@dg55 mha4mysql-manager-0.52]# mkdir -p /masterha/app1
3. [root@dg55 mha4mysql-manager-0.52]# cp samples/conf/\* /etc/masterha/
4. [root@dg55 mha4mysql-manager-0.52]# cat /etc/masterha/app1.cnf
5. [server default]
6. manager\_workdir=/masterha/app1
7. manager\_log=/masterha/app1/manager.log
8. user=root
9. password=123456
10. ssh\_user=root
11. repl\_user=r\_test
12. repl\_password=123456
13. ping\_interval=1
14. shutdown\_script=""
15. #master\_ip\_failover\_script="/usr/local/bin/master\_ip\_failover"
16. master\_ip\_online\_change\_script=""
17. report\_script=""
18. [server1]
19. hostname=192.168.123.13
20. master\_binlog\_dir="/mydata"
21. candidate\_master=1
22. [server2]
23. hostname=192.168.123.14
24. master\_binlog\_dir="/mydata"
25. candidate\_master=1

4:配置manager节点和node节点以及node节点间的ssh公钥信任

1. [root@dg55 ~]# ssh-keygen -t rsa
2. [root@dg55 ~]# ssh-copy-id -i /root/.ssh/id\_rsa.pub root@192.168.123.13
3. [root@dg55 ~]# ssh-copy-id -i /root/.ssh/id\_rsa.pub root@192.168.123.14
5. [root@dg55 ~]# ssh 192.168.123.13 "ifconfig |grep 'inet addr' |head -1"
6. inet addr:192.168.123.13  Bcast:192.168.123.255  Mask:255.255.255.0
7. [root@dg55 ~]# ssh 192.168.123.14 "ifconfig |grep 'inet addr' |head -1"
8. inet addr:192.168.123.14  Bcast:192.168.123.255  Mask:255.255.255.0

5：测试ssh连接

1. [root@dg55 ~]# masterha\_check\_ssh --conf=/etc/masterha/app1.cnf
2. Wed Jun  6 11:11:25 2012 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.
3. Wed Jun  6 11:11:25 2012 - [info] Reading application default configurations from /etc/masterha/app1.cnf..
4. Wed Jun  6 11:11:25 2012 - [info] Reading server configurations from /etc/masterha/app1.cnf..
5. Wed Jun  6 11:11:25 2012 - [info] Starting SSH connection tests..
6. Wed Jun  6 11:11:25 2012 - [debug]
7. Wed Jun  6 11:11:25 2012 - [debug]  Connecting via SSH from root@192.168.123.13(192.168.123.13) to root@192.168.123.14(192.168.123.14)..
8. Wed Jun  6 11:11:25 2012 - [debug]   ok.
9. Wed Jun  6 11:11:26 2012 - [debug]
10. Wed Jun  6 11:11:25 2012 - [debug]  Connecting via SSH from root@192.168.123.14(192.168.123.14) to root@192.168.123.13(192.168.123.13)..
11. Wed Jun  6 11:11:26 2012 - [debug]   ok.
12. Wed Jun  6 11:11:26 2012 - [info] All SSH connection tests passed successfully.

6：测试主从复制情况，默认使用root用户连接

1. mysql**>** select user,host,password from mysql.user;
2. +--------+----------------+-------------------------------------------+
3. | user   | host           | password                                  |
4. +--------+----------------+-------------------------------------------+
5. | root   | localhost      |                                           |
6. | root   | dg53.yang.com  |                                           |
7. | root   | 127.0.0.1      |                                           |
8. | root   | ::1            |                                           |
9. |        | localhost      |                                           |
10. |        | dg53.yang.com  |                                           |
11. | r\_test | 192.168.123.14 | \*6BB4837EB74329105EE4568DDA7DC67ED2CA2AD9 |
12. +--------+----------------+-------------------------------------------+
13. 7 rows in set (0.08 sec)
15. mysql**>** use mysql;
16. Database changed
18. mysql**>** update user set host='192.168.123.%' where user='r\_test';
19. Query OK, 1 row affected (0.05 sec)
20. Rows matched: 1  Changed: 1  Warnings: 0
22. mysql**>** commit;
23. Query OK, 0 rows affected (0.01 sec)
25. mysql**>** update user set host='192.168.123.%' where host='localhost' and user='root' and password='';
26. Query OK, 0 rows affected (0.00 sec)
27. Rows matched: 1  Changed: 1  Warnings: 0
29. mysql**>** update user set password=PASSWORD('123456') where user='root' and host='192.168.123.%';
30. Query OK, 0 rows affected (0.00 sec)
31. Rows matched: 1  Changed: 0  Warnings: 0
33. mysql**>** flush privileges;
34. Query OK, 0 rows affected (0.02 sec)
36. [root@dg53 ~]# whereis mysqlbinlog
37. mysqlbinlog: /usr/bin/mysqlbinlog
39. [root@dg53 ~]# mv /usr/bin/mysql\* /tmp
40. [root@dg54 ~]# mv /usr/bin/mysql\* /tmp
41. [root@dg53 ~]# ln -s /usr/local/mysql5.5.25/bin/\* /usr/local/bin/
42. [root@dg54 ~]# ln -s /usr/local/mysql5.5.25/bin/\* /usr/local/bin/
44. [root@dg55 ~]# masterha\_check\_repl --conf=/etc/masterha/app1.cnf
45. Wed Jun  6 12:39:03 2012 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping.
46. Wed Jun  6 12:39:03 2012 - [info] Reading application default configurations from /etc/masterha/app1.cnf..
47. Wed Jun  6 12:39:03 2012 - [info] Reading server configurations from /etc/masterha/app1.cnf..
48. Wed Jun  6 12:39:03 2012 - [info] MHA::MasterMonitor version 0.52.
49. Wed Jun  6 12:39:03 2012 - [info] Dead Servers:
50. Wed Jun  6 12:39:03 2012 - [info] Alive Servers:
51. Wed Jun  6 12:39:03 2012 - [info]   192.168.123.13(192.168.123.13:3306)
52. Wed Jun  6 12:39:03 2012 - [info]   192.168.123.14(192.168.123.14:3306)
53. Wed Jun  6 12:39:03 2012 - [info] Alive Slaves:
54. Wed Jun  6 12:39:03 2012 - [info]   192.168.123.14(192.168.123.14:3306)  Version=5.5.25-log (oldest major version between slaves) log-bin:enabled
55. Wed Jun  6 12:39:03 2012 - [info]     Replicating from 192.168.123.13(192.168.123.13:3306)
56. Wed Jun  6 12:39:03 2012 - [info]     Primary candidate for the new Master (candidate\_master is set)
57. Wed Jun  6 12:39:03 2012 - [info] Current Alive Master: 192.168.123.13(192.168.123.13:3306)
58. Wed Jun  6 12:39:03 2012 - [info] Checking slave configurations..
59. Wed Jun  6 12:39:03 2012 - [warning]  read\_only=1 is not set on slave 192.168.123.14(192.168.123.14:3306).
60. Wed Jun  6 12:39:03 2012 - [warning]  relay\_log\_purge=0 is not set on slave 192.168.123.14(192.168.123.14:3306).
61. Wed Jun  6 12:39:03 2012 - [info] Checking replication filtering settings..
62. Wed Jun  6 12:39:03 2012 - [info]  binlog\_do\_db= bbs,test, binlog\_ignore\_db= mysql
63. Wed Jun  6 12:39:03 2012 - [info]  Replication filtering check ok.
64. Wed Jun  6 12:39:03 2012 - [info] Starting SSH connection tests..
65. Wed Jun  6 12:39:05 2012 - [info] All SSH connection tests passed successfully.
66. Wed Jun  6 12:39:05 2012 - [info] Checking MHA Node version..
67. Wed Jun  6 12:39:05 2012 - [info]  Version check ok.
68. Wed Jun  6 12:39:05 2012 - [info] Checking SSH publickey authentication and checking recovery script configurations on the current master..
69. Wed Jun  6 12:39:05 2012 - [info]   Executing command: save\_binary\_logs --command=test --start\_file=mysql-bin.000011 --start\_pos=4 --binlog\_dir=/mydata --output\_file=/var/tmp/save\_binary\_logs\_test --manager\_version=0.52
70. Wed Jun  6 12:39:05 2012 - [info]   Connecting to root@192.168.123.13(192.168.123.13)..
71. Creating /var/tmp if not exists..    ok.
72. Checking output directory is accessible or not..
73. ok.
74. Binlog found at /mydata, up to mysql-bin.000011
75. Wed Jun  6 12:39:06 2012 - [info] Master setting check done.
76. Wed Jun  6 12:39:06 2012 - [info] Checking SSH publickey authentication and checking recovery script configurations on all alive slave servers..
77. Wed Jun  6 12:39:06 2012 - [info]   Executing command : apply\_diff\_relay\_logs --command=test --slave\_user=root --slave\_host=192.168.123.14 --slave\_ip=192.168.123.14 --slave\_port=3306 --workdir=/var/tmp --target\_version=5.5.25-log --manager\_version=0.52 --relay\_log\_info=/mydata/relay-log.info  --slave\_pass=xxx
78. Wed Jun  6 12:39:06 2012 - [info]   Connecting to root@192.168.123.14(192.168.123.14)..
79. Checking slave recovery environment settings..
80. Opening /mydata/relay-log.info ... ok.
81. Relay log found at /mydata, up to dg54-relay-bin.000019
82. Temporary relay log file is /mydata/dg54-relay-bin.000019
83. Testing mysql connection and privileges.. done.
84. Testing mysqlbinlog output.. done.
85. Cleaning up test file(s).. done.
86. Wed Jun  6 12:39:06 2012 - [info] Slaves settings check done.
87. Wed Jun  6 12:39:06 2012 - [info]
88. 192.168.123.13 (current master)
89. +--192.168.123.14
91. Wed Jun  6 12:39:06 2012 - [info] Checking replication health on 192.168.123.14..
92. Wed Jun  6 12:39:06 2012 - [info]  ok.
93. Wed Jun  6 12:39:06 2012 - [warning] master\_ip\_failover\_script is not defined.
94. Wed Jun  6 12:39:06 2012 - [warning] shutdown\_script is not defined.
95. Wed Jun  6 12:39:06 2012 - [info] Got exit code 0 (Not master dead).
97. MySQL Replication Health is OK.

7：启动管理节点进程

1. [root@dg55 ~]# nohup masterha\_manager --conf=/etc/masterha/app1.cnf **>** /tmp/mha\_manager.log  **<** /dev/null 2**>**&1 &
2. [1] 25516
3. [root@dg55 ~]# masterha\_check\_status --conf=/etc/masterha/app1.cnf
4. app1 (pid:25516) is running(0:PING\_OK), master:192.168.123.13

三：测试failover过程  
1：当前主库为192.168.123.13，关闭主库

1. mysql**>** show slave hosts;
2. +-----------+------+------+-----------+
3. | Server\_id | Host | Port | Master\_id |
4. +-----------+------+------+-----------+
5. |         2 |      | 3306 |         1 |
6. +-----------+------+------+-----------+
7. 1 row in set (0.00 sec)
9. [root@dg53 ~]# service mysqld stop
10. Shutting down MySQL...[  OK  ]

2：在管理节点上观察日志输出

|  |
| --- |
| [root@dg55 ~]# tail -f /masterha/app1/manager.log  Wed Jun  6 14:50:48 2012 - [info]  192.168.123.13 (current master)  +--192.168.123.14  Wed Jun  6 14:50:48 2012 - [warning] master\_ip\_failover\_script is not defined. Wed Jun  6 14:50:48 2012 - [warning] shutdown\_script is not defined. Wed Jun  6 14:50:48 2012 - [info] Set master ping interval 1 seconds. Wed Jun  6 14:50:48 2012 - [warning] secondary\_check\_script is not defined. It is highly recommended setting it to check master reachability from two or more routes. Wed Jun  6 14:50:48 2012 - [info] Starting ping health check on 192.168.123.13(192.168.123.13:3306).. Wed Jun  6 14:50:48 2012 - [info] Ping succeeded, sleeping until it doesn't respond..  Wed Jun  6 14:51:32 2012 - [warning] Got error on MySQL ping: 2006 (MySQL server has gone away) Wed Jun  6 14:51:32 2012 - [info] HealthCheck: SSH to 192.168.123.13 is reachable. Wed Jun  6 14:51:33 2012 - [warning] Got error on MySQL connect: 2013 (Lost connection to MySQL server at 'reading initial communication packet', system error: 111) Wed Jun  6 14:51:33 2012 - [warning] Connection failed 1 time(s).. Wed Jun  6 14:51:34 2012 - [warning] Got error on MySQL connect: 2013 (Lost connection to MySQL server at 'reading initial communication packet', system error: 111) Wed Jun  6 14:51:34 2012 - [warning] Connection failed 2 time(s).. Wed Jun  6 14:51:35 2012 - [warning] Got error on MySQL connect: 2013 (Lost connection to MySQL server at 'reading initial communication packet', system error: 111) Wed Jun  6 14:51:35 2012 - [warning] Connection failed 3 time(s).. Wed Jun  6 14:51:35 2012 - [warning] Master is not reachable from health checker! Wed Jun  6 14:51:35 2012 - [warning] Master 192.168.123.13(192.168.123.13:3306) is not reachable! Wed Jun  6 14:51:35 2012 - [warning] SSH is reachable. Wed Jun  6 14:51:35 2012 - [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.. Wed Jun  6 14:51:35 2012 - [warning] Global configuration file /etc/masterha\_default.cnf not found. Skipping. Wed Jun  6 14:51:35 2012 - [info] Reading application default configurations from /etc/masterha/app1.cnf.. Wed Jun  6 14:51:35 2012 - [info] Reading server configurations from /etc/masterha/app1.cnf.. Wed Jun  6 14:51:35 2012 - [info] Dead Servers: Wed Jun  6 14:51:35 2012 - [info]   192.168.123.13(192.168.123.13:3306) Wed Jun  6 14:51:35 2012 - [info] Alive Servers: Wed Jun  6 14:51:35 2012 - [info]   192.168.123.14(192.168.123.14:3306) Wed Jun  6 14:51:35 2012 - [info] Alive Slaves: Wed Jun  6 14:51:35 2012 - [info]   192.168.123.14(192.168.123.14:3306)  Version=5.5.25-log (oldest major version between slaves) log-bin:enabled Wed Jun  6 14:51:35 2012 - [info]     Replicating from 192.168.123.13(192.168.123.13:3306) Wed Jun  6 14:51:35 2012 - [info]     Primary candidate for the new Master (candidate\_master is set) Wed Jun  6 14:51:35 2012 - [info] Checking slave configurations.. Wed Jun  6 14:51:35 2012 - [warning]  read\_only=1 is not set on slave 192.168.123.14(192.168.123.14:3306). Wed Jun  6 14:51:35 2012 - [warning]  relay\_log\_purge=0 is not set on slave 192.168.123.14(192.168.123.14:3306). Wed Jun  6 14:51:35 2012 - [info] Checking replication filtering settings.. Wed Jun  6 14:51:35 2012 - [info]  Replication filtering check ok. Wed Jun  6 14:51:35 2012 - [info] Master is down! Wed Jun  6 14:51:35 2012 - [info] Terminating monitoring script. Wed Jun  6 14:51:35 2012 - [info] Got exit code 20 (Master dead). Wed Jun  6 14:51:35 2012 - [info] MHA::MasterFailover version 0.52. Wed Jun  6 14:51:35 2012 - [info] Starting master failover. Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] \* Phase 1: Configuration Check Phase.. Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] Dead Servers: Wed Jun  6 14:51:35 2012 - [info]   192.168.123.13(192.168.123.13:3306) Wed Jun  6 14:51:35 2012 - [info] Checking master reachability via mysql(double check).. Wed Jun  6 14:51:35 2012 - [info]  ok. Wed Jun  6 14:51:35 2012 - [info] Alive Servers: Wed Jun  6 14:51:35 2012 - [info]   192.168.123.14(192.168.123.14:3306) Wed Jun  6 14:51:35 2012 - [info] Alive Slaves: Wed Jun  6 14:51:35 2012 - [info]   192.168.123.14(192.168.123.14:3306)  Version=5.5.25-log (oldest major version between slaves) log-bin:enabled Wed Jun  6 14:51:35 2012 - [info]     Replicating from 192.168.123.13(192.168.123.13:3306) Wed Jun  6 14:51:35 2012 - [info]     Primary candidate for the new Master (candidate\_master is set) Wed Jun  6 14:51:35 2012 - [info] \*\* Phase 1: Configuration Check Phase completed. Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] \* Phase 2: Dead Master Shutdown Phase.. Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] Forcing shutdown so that applications never connect to the current master.. Wed Jun  6 14:51:35 2012 - [warning] master\_ip\_failover\_script is not set. Skipping invalidating dead master ip address. Wed Jun  6 14:51:35 2012 - [warning] shutdown\_script is not set. Skipping explicit shutting down of the dead master. Wed Jun  6 14:51:35 2012 - [info] \* Phase 2: Dead Master Shutdown Phase completed. Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] \* Phase 3: Master Recovery Phase.. Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] \* Phase 3.1: Getting Latest Slaves Phase.. Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] The latest binary log file/position on all slaves is mysql-bin.000021:107 Wed Jun  6 14:51:35 2012 - [info] Latest slaves (Slaves that received relay log files to the latest): Wed Jun  6 14:51:35 2012 - [info]   192.168.123.14(192.168.123.14:3306)  Version=5.5.25-log (oldest major version between slaves) log-bin:enabled Wed Jun  6 14:51:35 2012 - [info]     Replicating from 192.168.123.13(192.168.123.13:3306) Wed Jun  6 14:51:35 2012 - [info]     Primary candidate for the new Master (candidate\_master is set) Wed Jun  6 14:51:35 2012 - [info] The oldest binary log file/position on all slaves is mysql-bin.000021:107 Wed Jun  6 14:51:35 2012 - [info] Oldest slaves: Wed Jun  6 14:51:35 2012 - [info]   192.168.123.14(192.168.123.14:3306)  Version=5.5.25-log (oldest major version between slaves) log-bin:enabled Wed Jun  6 14:51:35 2012 - [info]     Replicating from 192.168.123.13(192.168.123.13:3306) Wed Jun  6 14:51:35 2012 - [info]     Primary candidate for the new Master (candidate\_master is set) Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] \* Phase 3.2: Saving Dead Master's Binlog Phase.. Wed Jun  6 14:51:35 2012 - [info]  Wed Jun  6 14:51:35 2012 - [info] Fetching dead master's binary logs.. Wed Jun  6 14:51:35 2012 - [info] Executing command on the dead master 192.168.123.13(192.168.123.13:3306): save\_binary\_logs --command=save --start\_file=mysql-bin.000021  --start\_pos=107 --binlog\_dir=/mydata --output\_file=/var/tmp/saved\_master\_binlog\_from\_192.168.123.13\_3306\_20120606145135.binlog --handle\_raw\_binlog=1 --disable\_log\_bin=0 --manager\_version=0.52   Creating /var/tmp if not exists..    ok.  Concat binary/relay logs from mysql-bin.000021 pos 107 to mysql-bin.000021 EOF into /var/tmp/saved\_master\_binlog\_from\_192.168.123.13\_3306\_20120606145135.binlog ..   Dumping binlog format description event, from position 0 to 107.. ok.   Dumping effective binlog data from /mydata/mysql-bin.000021 position 107 to tail(126).. ok.  Concat succeeded. Wed Jun  6 14:51:36 2012 - [info] scp from[root@192.168.123.13:/var/tmp/saved\_master\_binlog\_from\_192.168.123.13\_3306\_20120606145135.binlog](mailto:root@192.168.123.13:/var/tmp/saved_master_binlog_from_192.168.123.13_3306_20120606145135.binlog) to local:/masterha/app1/saved\_master\_binlog\_from\_192.168.123.13\_3306\_20120606145135.binlog succeeded. Wed Jun  6 14:51:36 2012 - [info] HealthCheck: SSH to 192.168.123.14 is reachable. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] \* Phase 3.3: Determining New Master Phase.. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] Finding the latest slave that has all relay logs for recovering other slaves.. Wed Jun  6 14:51:37 2012 - [info] All slaves received relay logs to the same position. No need to resync each other. Wed Jun  6 14:51:37 2012 - [info] Searching new master from slaves.. Wed Jun  6 14:51:37 2012 - [info]  Candidate masters from the configuration file: Wed Jun  6 14:51:37 2012 - [info]   192.168.123.14(192.168.123.14:3306)  Version=5.5.25-log (oldest major version between slaves) log-bin:enabled Wed Jun  6 14:51:37 2012 - [info]     Replicating from 192.168.123.13(192.168.123.13:3306) Wed Jun  6 14:51:37 2012 - [info]     Primary candidate for the new Master (candidate\_master is set) Wed Jun  6 14:51:37 2012 - [info]  Non-candidate masters: Wed Jun  6 14:51:37 2012 - [info]  Searching from candidate\_master slaves which have received the latest relay log events.. Wed Jun  6 14:51:37 2012 - [info] New master is 192.168.123.14(192.168.123.14:3306) Wed Jun  6 14:51:37 2012 - [info] Starting master failover.. Wed Jun  6 14:51:37 2012 - [info]  From: 192.168.123.13 (current master)  +--192.168.123.14  To: 192.168.123.14 (new master) Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] \* Phase 3.3: New Master Diff Log Generation Phase.. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info]  This server has all relay logs. No need to generate diff files from the latest slave. Wed Jun  6 14:51:37 2012 - [info] Sending binlog.. Wed Jun  6 14:51:37 2012 - [info] scp from local:/masterha/app1/saved\_master\_binlog\_from\_192.168.123.13\_3306\_20120606145135.binlog to[root@192.168.123.14:/var/tmp/saved\_master\_binlog\_from\_192.168.123.13\_3306\_20120606145135.binlog](mailto:root@192.168.123.14:/var/tmp/saved_master_binlog_from_192.168.123.13_3306_20120606145135.binlog) succeeded. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] \* Phase 3.4: Master Log Apply Phase.. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] \*NOTICE: If any error happens from this phase, manual recovery is needed. Wed Jun  6 14:51:37 2012 - [info] Starting recovery on 192.168.123.14(192.168.123.14:3306).. Wed Jun  6 14:51:37 2012 - [info]  Generating diffs succeeded. Wed Jun  6 14:51:37 2012 - [info] Waiting until all relay logs are applied. Wed Jun  6 14:51:37 2012 - [info]  done. Wed Jun  6 14:51:37 2012 - [info] Getting slave status.. Wed Jun  6 14:51:37 2012 - [info] This slave(192.168.123.14)'s Exec\_Master\_Log\_Pos equals to Read\_Master\_Log\_Pos(mysql-bin.000021:107). No need to recover from Exec\_Master\_Log\_Pos. Wed Jun  6 14:51:37 2012 - [info] Connecting to the target slave host 192.168.123.14, running recover script.. Wed Jun  6 14:51:37 2012 - [info] Executing command: apply\_diff\_relay\_logs --command=apply --slave\_user=root --slave\_host=192.168.123.14 --slave\_ip=192.168.123.14  --slave\_port=3306 --apply\_files=/var/tmp/saved\_master\_binlog\_from\_192.168.123.13\_3306\_20120606145135.binlog --workdir=/var/tmp --target\_version=5.5.25-log --timestamp=20120606145135 --handle\_raw\_binlog=1 --disable\_log\_bin=0 --manager\_version=0.52 --slave\_pass=xxx Wed Jun  6 14:51:37 2012 - [info]  Applying differential binary/relay log files /var/tmp/saved\_master\_binlog\_from\_192.168.123.13\_3306\_20120606145135.binlog on 192.168.123.14:3306. This may take long time... Applying log files succeeded. Wed Jun  6 14:51:37 2012 - [info]  All relay logs were successfully applied. Wed Jun  6 14:51:37 2012 - [info] Getting new master's binlog name and position.. Wed Jun  6 14:51:37 2012 - [info]  mysql-bin.000023:107 Wed Jun  6 14:51:37 2012 - [info]  All other slaves should start replication from here. Statement should be: CHANGE MASTER TO MASTER\_HOST='192.168.123.14', MASTER\_PORT=3306, MASTER\_LOG\_FILE='mysql-bin.000023', MASTER\_LOG\_POS=107, MASTER\_USER='r\_test', MASTER\_PASSWORD='xxx'; Wed Jun  6 14:51:37 2012 - [warning] master\_ip\_failover\_script is not set. Skipping taking over new master ip address. Wed Jun  6 14:51:37 2012 - [info] \*\* Finished master recovery successfully. Wed Jun  6 14:51:37 2012 - [info] \* Phase 3: Master Recovery Phase completed. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] \* Phase 4: Slaves Recovery Phase.. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] \* Phase 4.1: Starting Parallel Slave Diff Log Generation Phase.. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] Generating relay diff files from the latest slave succeeded. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] \* Phase 4.2: Starting Parallel Slave Log Apply Phase.. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] All new slave servers recovered successfully. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] \* Phase 5: New master cleanup phease.. Wed Jun  6 14:51:37 2012 - [info]  Wed Jun  6 14:51:37 2012 - [info] Resetting slave info on the new master.. Wed Jun  6 14:51:37 2012 - [info] Master failover to 192.168.123.14(192.168.123.14:3306) completed successfully. Wed Jun  6 14:51:37 2012 - [info]  ----- Failover Report -----  app1: MySQL Master failover 192.168.123.13 to 192.168.123.14 succeeded  Master 192.168.123.13 is down!  Check MHA Manager logs at dg55.yang.com:/masterha/app1/manager.log for details.  Started automated(non-interactive) failover. The latest slave 192.168.123.14(192.168.123.14:3306) has all relay logs for recovery. Selected 192.168.123.14 as a new master. 192.168.123.14: OK: Applying all logs succeeded. Generating relay diff files from the latest slave succeeded. 192.168.123.14: Resetting slave info succeeded. Master failover to 192.168.123.14(192.168.123.14:3306) completed successfully. |

3：在原从库192.168.123.14上查看结果

1. mysql**>** show master status;
2. +------------------+----------+--------------+------------------+
3. | File             | Position | Binlog\_Do\_DB | Binlog\_Ignore\_DB |
4. +------------------+----------+--------------+------------------+
5. | mysql-bin.000023 |      107 | bbs,test     | mysql            |
6. +------------------+----------+--------------+------------------+
7. 1 row in set (0.00 sec)
9. mysql**>** show slave status\G;
10. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1. row \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
11. Slave\_IO\_State:
12. Master\_Host: 192.168.123.13
13. Master\_User: r\_test
14. Master\_Port: 3306
15. Connect\_Retry: 60
16. Master\_Log\_File:
17. Read\_Master\_Log\_Pos: 4
18. Relay\_Log\_File: dg54-relay-bin.000001
19. Relay\_Log\_Pos: 4
20. Relay\_Master\_Log\_File:
21. Slave\_IO\_Running: No
22. Slave\_SQL\_Running: No
23. Replicate\_Do\_DB:
24. Replicate\_Ignore\_DB:
25. Replicate\_Do\_Table:
26. Replicate\_Ignore\_Table:
27. Replicate\_Wild\_Do\_Table:
28. Replicate\_Wild\_Ignore\_Table:
29. Last\_Errno: 0
30. Last\_Error:
31. Skip\_Counter: 0
32. Exec\_Master\_Log\_Pos: 0
33. Relay\_Log\_Space: 126
34. Until\_Condition: None
35. Until\_Log\_File:
36. Until\_Log\_Pos: 0
37. Master\_SSL\_Allowed: No
38. Master\_SSL\_CA\_File:
39. Master\_SSL\_CA\_Path:
40. Master\_SSL\_Cert:
41. Master\_SSL\_Cipher:
42. Master\_SSL\_Key:
43. Seconds\_Behind\_Master: NULL
44. Master\_SSL\_Verify\_Server\_Cert: No
45. Last\_IO\_Errno: 0
46. Last\_IO\_Error:
47. Last\_SQL\_Errno: 0
48. Last\_SQL\_Error:
49. Replicate\_Ignore\_Server\_Ids:
50. Master\_Server\_Id: 1
51. 1 row in set (0.00 sec)
53. ERROR:
54. No query specified

备注：本文只简单记录了mha的环境部署过程，更多高级的内容，例如配合keepalive使用VIP，让客户端连接数据库透明化以及手动failover和master\_ip\_failover\_script脚本，半同步复制等功能后续将继续研究！