<http://galeracluster.com/documentation-webpages/gettingstarted.html#galera-cluster-for-mysql>

**INSTALL AND CONFIG GALERA REPLICATE DATABASE MYSQL**

# INFOR SERVER

Type of OS : Linux 6.5 64bit.

Mysql-proxy1 : 10.1.20.191

Mysql-proxy2 : 10.1.20.192

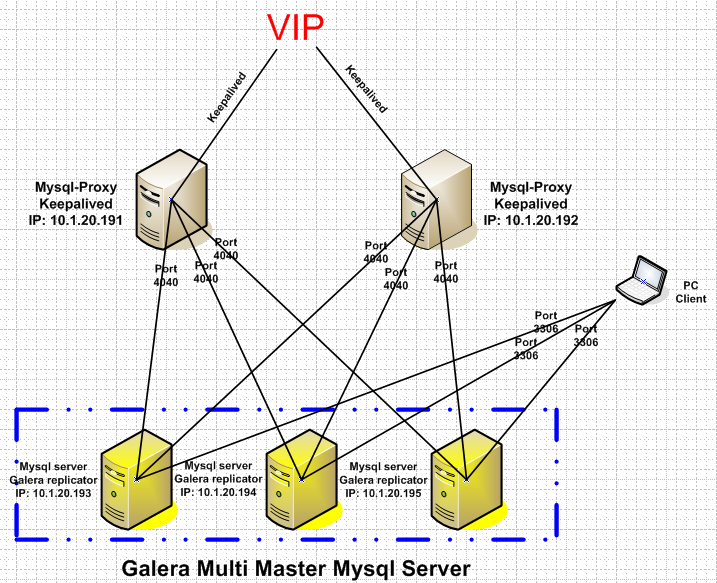
Main server : 10.1.20.193

Member server 1 : 10.1.20.194

Member server 2 : 10.1.20.195

VIP : 10.1.20.100

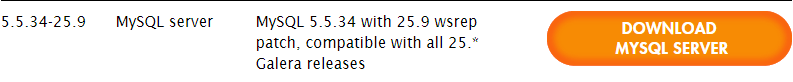
# ARCHITECTURE.



# DOWNLOAD SOURCE.

- Login website <http://galeracluster.com/downloads/> to download

-



- Download :

- Login website <https://launchpad.net/galera/+download> to download Galera Replicator

- Download : 

# INSTALL AND CONFIG GALERA REPLICATOR.

- Install some package necessary.

*# yum -y install gcc gcc-c++ boost-devel scons check-devel openssl-devel*

*# yum -y install boost-devel*

*# yum -y install bzr*

- Up source **galera-25.3.5-src.tar.gz** on 3 servers and install.

*# cd /opt*

*# tar -zxvf galera-25.3.5-src.tar.gz*

*# mv galera-25.3.5-src galera*

*# chown -R mysql:root galera*

*# cd galera*

*# ./scripts/build.sh*

*…*

*…*

*Running suite(s): GCS component message*

*100%: Checks: 1, Failures: 0, Errors: 0*

*Running suite(s): GCS send monitor*

*100%: Checks: 5, Failures: 0, Errors: 0*

*Running suite(s): GCS state message*

*100%: Checks: 3, Failures: 0, Errors: 0*

*Running suite(s): GCS FIFO functions*

*100%: Checks: 1, Failures: 0, Errors: 0*

*Running suite(s): GCS core protocol*

*100%: Checks: 1, Failures: 0, Errors: 0*

*Running suite(s): GCS defragmenter*

*100%: Checks: 1, Failures: 0, Errors: 0*

*Running suite(s): GCS node context*

*100%: Checks: 1, Failures: 0, Errors: 0*

*Running suite(s): GCS membership changes*

*100%: Checks: 1, Failures: 0, Errors: 0*

*Running suite(s): GCS backend interface*

*100%: Checks: 1, Failures: 0, Errors: 0*

*Running suite(s): GCS core context*

*100%: Checks: 2, Failures: 0, Errors: 0*

*Running suite(s): GCS state transfer FC*

*100%: Checks: 3, Failures: 0, Errors: 0*

*Total test failed: 0*

*g++ -o libgalera\_smm.so -m64 -Wl,-melf\_x86\_64 -shared galerautils/src/gu\_abort.os galerautils/src/gu\_dbug.os galerautils/src/gu\_fifo.os galerautils/src/gu\_lock\_step.os galerautils/src/gu\_log.os galerautils/src/gu\_mem.os galerautils/src/gu\_mmh3.os galerautils/src/gu\_spooky.os galerautils/src/gu\_rand.os galerautils/src/gu\_mutex.os galerautils/src/gu\_print\_buf.os galerautils/src/gu\_to.os galerautils/src/gu\_utils.os galerautils/src/gu\_uuid.os galerautils/src/gu\_backtrace.os galerautils/src/gu\_limits.os galerautils/src/gu\_time.os galerautils/src/gu\_datetime.os galerautils/src/gu\_exception.os galerautils/src/gu\_logger.os galerautils/src/gu\_prodcons.os galerautils/src/gu\_regex.os galerautils/src/gu\_string.os galerautils/src/gu\_uri.os galerautils/src/gu\_buffer.os galerautils/src/gu\_utils++.os galerautils/src/gu\_config.os galerautils/src/gu\_resolver.os gcache/src/gcache\_fd.os gcache/src/gcache\_mmap.os gcache/src/GCache\_seqno.os gcache/src/gcache\_params.os gcache/src/gcache\_page.os gcache/src/gcache\_page\_store.os gcache/src/gcache\_rb\_store.os gcache/src/gcache\_mem\_store.os gcache/src/GCache\_memops.os gcache/src/GCache.os gcomm/src/conf.os gcomm/src/defaults.os gcomm/src/evs\_consensus.os gcomm/src/evs\_input\_map2.os gcomm/src/evs\_message2.os gcomm/src/evs\_node.os gcomm/src/evs\_proto.os gcomm/src/gmcast.os gcomm/src/gmcast\_proto.os gcomm/src/histogram.os gcomm/src/pc.os gcomm/src/pc\_proto.os gcomm/src/protonet.os gcomm/src/protostack.os gcomm/src/transport.os gcomm/src/uuid.os gcomm/src/view.os gcomm/src/socket.os gcomm/src/asio\_tcp.os gcomm/src/asio\_udp.os gcomm/src/asio\_protonet.os gcs/src/gcs\_params.os gcs/src/gcs\_conf.os gcs/src/gcs\_fifo\_lite.os gcs/src/gcs\_msg\_type.os gcs/src/gcs\_comp\_msg.os gcs/src/gcs\_sm.os gcs/src/gcs\_backend.os gcs/src/gcs\_dummy.os gcs/src/gcs\_act\_proto.os gcs/src/gcs\_defrag.os gcs/src/gcs\_state\_msg.os gcs/src/gcs\_node.os gcs/src/gcs\_group.os gcs/src/gcs\_core.os gcs/src/gcs\_fc.os gcs/src/gcs.os gcs/src/gcs\_gcomm.os galera/src/mapped\_buffer.os galera/src/write\_set.os galera/src/trx\_handle.os galera/src/key\_entry.os galera/src/wsdb.os galera/src/certification.os galera/src/galera\_service\_thd.os galera/src/wsrep\_params.os galera/src/replicator\_smm\_params.os galera/src/gcs\_action\_source.os galera/src/galera\_info.os galera/src/replicator.os galera/src/ist.os galera/src/gcs\_dummy.os galera/src/saved\_state.os galera/src/libmmgalera++-replicator\_smm.os galera/src/libmmgalera++-replicator\_str.os galera/src/libmmgalera++-replicator\_smm\_stats.os galera/src/libmmgalera++-wsrep\_provider.os -lpthread -lrt -lssl -lcrypto*

*scons: done building targets.*

*+ test no == yes*

*+ test no == yes*

# INSTALL AND CONFIG MYSQL SERVER.

- Up source **mysql-5.534\_wscrep\_25.9-linux-x86\_64.tar.gz** on **server Main.**

*# cd /opt*

*# tar -zxvf mysql-5.534\_wscrep\_25.9-linux-x86\_64.tar.gz*

*# mv mysql-5.534\_wscrep\_25.9-linux-x86\_64 mysql*

*# chown -R mysql:root mysql*

*# vim /etc/mysql.cnf*

*Edit file as content below and save:*

*[client]*

*port = 3306*

*socket = /tmp/mysql.sock*

*[mysqld]*

*port = 3306*

*socket = /tmp/mysql.sock*

*skip-name-resolve*

*skip-external-locking*

*key\_buffer\_size = 64M*

*max\_allowed\_packet = 16M*

*max\_connect\_errors = 1000000*

*max-connections=666*

*sort\_buffer\_size = 2M*

*read\_buffer\_size = 2M*

*read\_rnd\_buffer\_size = 2M*

*myisam\_sort\_buffer\_size = 16M*

*thread\_cache\_size = 128*

*open\_files\_limit = 65535*

*query\_cache\_size = 128M*

*query\_cache\_type=1*

*table\_definition\_cache = 400*

*table\_open\_cache = 128*

*max\_heap\_table\_size=128M*

*tmp\_table\_size=64M*

*max\_user\_connections=500*

*innodb\_flush\_method = O\_DIRECT*

*innodb\_log\_files\_in\_group = 2*

*skip-slave-start*

*thread\_concurrency = 8*

*server-id = 1*

*character\_set\_server=utf8*

*collation\_server=utf8\_general\_ci*

*expire\_logs\_days = 6*

*innodb\_data\_home\_dir = /opt/mysql/data*

*innodb\_data\_file\_path = ibdata1:2000M;ibdata2:2000M:autoextend*

*innodb\_log\_group\_home\_dir = /opt/mysql/data*

*innodb\_buffer\_pool\_size = 1G*

*innodb\_log\_buffer\_size = 12M*

*innodb\_flush\_log\_at\_trx\_commit = 1*

*innodb\_file\_per\_table = 1*

*innodb\_lock\_wait\_timeout = 50*

*log\_error = /opt/mysql/data/mysql-error.log*

*log\_queries\_not\_using\_indexes = 1*

*slow\_query\_log = 1*

*slow\_query\_log\_file = /opt/mysql/data/mysql-slow.log*

*binlog\_format=ROW*

*default\_storage\_engine=InnoDB*

*innodb\_autoinc\_lock\_mode=2*

*datadir=/opt/mysql/data*

*innodb\_buffer\_pool\_size=28G*

*innodb\_log\_file\_size=100M*

*innodb\_file\_per\_table=1*

*innodb\_flush\_log\_at\_trx\_commit=2*

*[mysqldump]*

*quick*

*max\_allowed\_packet = 16M*

*[mysql]*

*no-auto-rehash*

*[myisamchk]*

*key\_buffer\_size = 8M*

*sort\_buffer\_size = 8M*

*read\_buffer = 8M*

*write\_buffer = 8M*

*myisam\_recover = FORCE,BACKUP*

*[mysqlhotcopy]*

*interactive-timeout*

*default-time-zone = '+00:00'*

*!includedir /etc/mysql/conf.d /*

*# vim /opt/mysql/support-files/ mysql.server*

*Edit : basedir=/opt/mysql*

*datadir=/opt/mysql/data*

*# cp /opt/mysql/support-files/mysql.server /etc/init.d/*

*# mv /etc/init.d/ mysql.server /etc/init.d/ mysql*

*# /opt/mysql/scripts/mysql\_install\_db --ldata=/opt/mysql/data --user=mysql --basedir=/opt/mysql*

*# service mysql start*

- Setup password for root user

*# mysqladmin -u root password "123@123a"*

- Connect database server:

*# mysql -uroot -p*

*Enter password:123@123a*

*…*

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

*mysql>*

- Run command to remove all empty users.

*mysql> SET wsrep\_on=OFF;*

*DELETE FROM mysql.user*

*WHERE user='';*

- Create a wsrep user to configuration of a write-set replication user.

*mysql> SET wsrep\_on=OFF;*

*GRANT ALL ON \*.\* TO 'wsrep\_sst-user'@'%'*

*IDENTIFIED BY '123456';*

- Create file config galera Replicator

*# mkdir -p /etc/mysql/conf.d/*

*# cp /opt/mysql/support-files/wsrep.cnf.sh /opt/mysql/support-files/wsrep.cnf*

*# mv /opt/mysql/support-files/wsrep.cnf /etc/mysql/conf.d/*

- Edit file wsrep.cnf

*# vim /etc/mysql/conf.d/ wsrep.cnf*

*[mysqld]*

*binlog\_format=ROW*

*default-storage-engine=innodb*

*innodb\_autoinc\_lock\_mode=2*

*innodb\_locks\_unsafe\_for\_binlog=1*

*query\_cache\_size=0*

*query\_cache\_type=0*

*bind-address=0.0.0.0*

*wsrep\_provider=/opt/galera /libgalera\_smm.so*

*wsrep\_cluster\_name="my\_wsrep\_cluster" -------------------->Name cluster*

*wsrep\_cluster\_address="gcomm:// "*

*wsrep\_node\_name='med.mysql1' --------------------> Hostname server*

*wsrep\_node\_address='10.1.20.193' --------------------> IP Server Main*

*wsrep\_slave\_threads=16*

*wsrep\_certify\_nonPK=1*

*wsrep\_max\_ws\_rows=131072*

*wsrep\_max\_ws\_size=1073741824*

*wsrep\_debug=1*

*wsrep\_convert\_LOCK\_to\_trx=0*

*wsrep\_retry\_autocommit=1*

*wsrep\_auto\_increment\_control=1*

*wsrep\_drupal\_282555\_workaround=0*

*wsrep\_causal\_reads=0*

*wsrep\_notify\_cmd=*

*wsrep\_sst\_method=rsync*

*wsrep\_sst\_auth=root:123456*

- Stop Mysql server and copy Mysql server to 2 member server.

*# service mysql stop*

*# ps -ef | grep mysql*

*# tar -zcvf /opt/mysql.tar.gz /opt/mysql*

*# scp /opt/mysql.tar.gz 10.1.20.194:/opt/*

*# scp /opt/mysql.tar.gz 10.1.20.195:/opt/*

- Copy file /etc/mysq.cnf , /etc/mysql/conf.d/wsrep.cnf, /etc/init.d/mysql to 2 member server.

*# scp /etc/mysq.cnf 10.1.20.194:/etc/*

*# scp /etc/mysq.cnf 10.1.20.195:/etc/*

*# scp /etc/mysql/conf.d/wsrep.cnf 10.1.20.194:/etc/ mysql/conf.d/*

*# scp /etc/mysql/conf.d/wsrep.cnf 10.1.20.195:/etc/ mysql/conf.d/*

*# scp /etc/init.d/mysql 10.1.20.194:/ etc/init.d/*

*# scp /etc/init.d/mysql 10.1.20.195:/ etc/init.d/*

- On 2 member server.

*# chown -R mysql:root /opt/mysql*

# CONFIGURING THE SERVER.

- Stop firewall on all server

*# service iptables stop*

*# service iptables status*

*iptables: Firewall is not running.*

- Disabling Selinux

# vim /etc/selinux/config

Edit : SELINUX=disabled

# CONFIGURING THE DATABASE.

- Start all mysql server on 3 server.

*# service mysql start*

- Check log mysql-error.log to confirm mysql server start successful , no error.

*# tail -f /opt/mysql/data/mysql-error.log*

- Login mysql server and run command to create client connections between the nodes and allow the nodes to carry out state snapshot transfers with each other.

*mysql > select User,host from mysql.user;*

*mysql >*

*GRANT ALL ON \*.\* TO ‘root’@’med.mysql1’;*

*GRANT ALL ON \*.\* TO ‘root’@’med.mysql2’;*

*GRANT ALL ON \*.\* TO ‘root’@’med.mysql3’;*

*mysql > select User,host from mysql.user;*

*+----------------+------------+*

*| User | host |*

*+----------------+------------+*

*| quangdt | % |*

*| root | % |*

*| wsrep\_sst-user | % |*

*| root | 127.0.0.1 |*

*| root | ::1 |*

*| root | localhost |*

*| root | med.mysql1 |*

*| root | med.mysql2 |*

*| root | med.mysql3 |*

*+----------------+------------+*

*9 rows in set (0.14 sec)*

*mysql>*

**Note : med.mysql1, med.mysql2, med.mysql3 is hostname server.**

- Stop mysql server on all server.

*# service mysql stop*

# STARING THE CLUSTER DATABASE

## STARTING THE FIRST CLUSTER NODE (MAIN SERVER)

*# tail -f /opt/mysql/data/mysql-error.log*

*# service mysql start*

- Check log mysql-error to confirm main server had join group cluster

*2014-12-24 12:31:39 22500 [Note] WSREP: Quorum results:*

*version = 2,*

*component = PRIMARY,*

*conf\_id = 16,*

***members = 1/1 (joined/total),***

*act\_id = 15,*

*last\_appl. = -1,*

*protocols = 0/4/2 (gcs/repl/appl),*

*group UUID = c4d32ba6-8b74-11e4-963b-8ae13e2ee663*

*2014-12-24 12:31:39 22500 [Note] WSREP: Flow-control interval: [28, 28]*

## STARTING THE MEMBER CLUSTER NODE (MEMBER SERVER)

- On member server 10.1.20.194

*# tail -f /opt/mysql/data/mysql-error.log*

*# service mysql start*

- Check log mysql-error to confirm main server had join group cluster

*2014-12-24 12:39:28 24218 [Note] WSREP: Quorum results:*

*version = 2,*

*component = PRIMARY,*

*conf\_id = 20,*

***members = 2/2 (joined/total),***

*act\_id = 19,*

*last\_appl. = 0,*

*protocols = 0/4/2 (gcs/repl/appl),*

*group UUID = c4d32ba6-8b74-11e4-963b-8ae13e2ee663*

*2014-12-24 12:39:28 24218 [Note] WSREP: Flow-control interval: [28, 28]*

- On member server 10.1.20.194

*# tail -f /opt/mysql/data/mysql-error.log*

*# service mysql start*

- Check log mysql-error to confirm main server had join group cluster

*2014-12-24 12:43:19 24218 [Note] WSREP: Quorum results:*

*version = 2,*

*component = PRIMARY,*

*conf\_id = 20,*

***members = 3/3 (joined/total),***

*act\_id = 19,*

*last\_appl. = 0,*

*protocols = 0/4/2 (gcs/repl/appl),*

*group UUID = c4d32ba6-8b74-11e4-963b-8ae13e2ee663*

*2014-12-24 12:43:19 24218 [Note] WSREP: Flow-control interval: [28, 28]*

## CHANGE MAIN SERVER TO MEMBER SERVER

- Stop Mysql server on Main server 10.1.20.193

*# service mysql stop*

- Backup file /etc/mysql/conf.d/wsrep.cnf to /etc/mysql/conf.d/wsrep\_ fist\_node\_good.cnf

*# cp /etc/mysql/conf.d/wsrep.cnf /etc/mysql/conf.d/wsrep\_ fist\_node\_good.cnf*

- Edit file/etc/mysql/conf.d/wsrep.cnf

Change :

*wsrep\_cluster\_address="gcomm:// " to*

*wsrep\_cluster\_address="gcomm://10.1.20.194,10.1.20.195"*

- Start Mysql server again

# service mysql start

*# tail -f /opt/mysql/data/mysql-error.log*

*2014-12-24 12:50:23 23644 [Note] WSREP: Quorum results:*

*version = 2,*

*component = PRIMARY,*

*conf\_id = 20,*

***members = 1/3 (joined/total),***

*act\_id = 19,*

*last\_appl. = 0,*

*protocols = 0/4/2 (gcs/repl/appl),*

*group UUID = c4d32ba6-8b74-11e4-963b-8ae13e2ee663*

*2014-12-24 12:50:23 23644 [Note] WSREP: Flow-control interval: [28, 28]*

# INSTALL AND CONFIG MYSQL-PROXY

- Login web <http://dev.mysql.com/downloads/mysql-proxy/> to download **mysql-proxy-0.8.5-linux-glibc2.3-x86-64bit.tar.gz**

- Install and config

*# cd /opt/*

*# tar -zxvf mysql-proxy-0.8.5-linux-glibc2.3-x86-64bit.tar.gz*

*# mv mysql-proxy-0.8.5-linux-glibc2.3-x86-64bit mysql-proxy*

*# chown -R mysql:root mysql-proxy*

- Create file configuration, script

*# vim/opt/mysql-proxy/startMysql\_Proxy.sh*

*/opt/mysql-proxy/bin/mysql-proxy --defaults-file=/opt/mysql-proxy/mysql-proxy.cnf*

*# vim/opt/mysql-proxy/mysql-proxy.cnf*

*[mysql-proxy]*

*daemon = true*

*pid-file = /opt/mysql-proxy/mysql-proxy.pid*

*log-file = /opt/mysql-proxy/mysql-proxy.log*

*log-level = debug*

*proxy-address = 0.0.0.0:4040*

*proxy-backend-addresses = 10.1.20.193:3306,10.1.20.194:3306,10.1.20.195:3306*

- Start mysql-proxy

*#sh /opt/mysql-proxy/startMysql\_Proxy.sh*

*# ps ux | grep mysql*

*root 27991 0.0 0.0 30040 1228 ? S Dec25 0:02 /opt/mysql-proxy/libexec/mysql-proxy --defaults-file=/opt/mysql-proxy/mysql-proxy.cnf*

- Try to connect mysql server my mysql-proxy port 4040

*# mysql -uroot -pxxxxxx -P4040*

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

*mysql>*

# INSTALL AND CONFIG KEEPALIVED SERVICE

\* On server mysql-proxy1 which is MASTER keepalive.

*# yum -y install keepalived*

*# cd /etc/keepalived/*

*# cp keepalived.conf keepalived.conf.bk*

*# vim keepalived.conf*

*vrrp\_script chk\_amq {*

*script "</dev/tcp/127.0.0.1/****4040****"*

*interval 2 # check every 2 seconds*

*weight -30 # add 2 points of prio if OK*

*}*

*vrrp\_instance VI\_1 {*

*interface bond1 # interface to monitor*

*state MASTER*

*virtual\_router\_id 20 # Assign one ID for this route*

*priority 122 # 101 on master, 100 on backup*

*virtual\_ipaddress {*

***10.1.20.100***

*}*

*track\_script {*

*chk\_amq*

*}*

*}*

*# /etc/init.d/keepalived start*

*# ps ux | grep keepalived*

*# tail -f /var/log/messages*

\* On server mysql-proxy1 which is SLAVE keepalive.

*# yum -y install keepalived*

*# cd /etc/keepalived/*

*# cp keepalived.conf keepalived.conf.bk*

*# vim keepalived.conf*

*vrrp\_script chk\_amq {*

*script "</dev/tcp/127.0.0.1/****4040****"*

*interval 2 # check every 2 seconds*

*weight 2 # add 2 points of prio if OK*

*}*

*vrrp\_instance VI\_1 {*

*interface bond1 # interface to monitor*

*state BACKUP*

*virtual\_router\_id 20 # Assign one ID for this route*

*priority 100 # 101 on master, 100 on backup*

*virtual\_ipaddress {*

***10.1.20.100***

*}*

*track\_script {*

*chk\_amq*

*}*

*}*

*# /etc/init.d/keepalived start*

*# ps ux | grep keepalived*

*# tail -f /var/log/messages*

# TEST CLUSTER

- On any server we will try create new database. After we check result on remain server to confirm that new database is created have synced on remain server.

Example :

- On server 10.1.20.193

*# mysql -uroot -pxxxxx*

*mysql> create database TEST\_GALERA;*

*mysql> show databases;*

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

| Database |

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

| information\_schema |

| mysql |

| performance\_schema |

| **TEST\_GALERA** |

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

5 rows in set (0.00 sec)

- On remain server 10.1.20.194 and 195 try to check result in the database.

*# mysql -uroot -pxxxxx*

*mysql> show databases;*

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

| Database |

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

| information\_schema |

| mysql |

| performance\_schema |

| **TEST\_GALERA** |

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

5 rows in set (0.00 sec)

SUCCESSFUL SYNC DATA ACROSS SERVERS

- We can try more by change password root on any server. After login on remain server with new root password.

# TEST KEEPALIVED

\* On server 191

- Shutdown server 191

Expect : VIP will move from server 191 to 192

- Down Ethernet card NIC server 191

Expect: VIP will move from server 191 to 192

\* On server 192

- Shutdown server 192

Expect : VIP will move from server 192 to 191

- Down Ethernet card NIC server 192

Expect: VIP will move from server 192 to 191

# TEST MYSQL-PROXY

\* On server 191

- Down service mysql-proxy

Expect: VIP will move from server 191 to 192. Client PC still connect database normally.

\* On server 192

- Down service mysql-proxy

Expect: VIP will move from server 192 to 191. Client PC still connect database normally.

# ERROR

[ERROR] WSREP: gcs/src/gcs\_group.c:gcs\_group\_handle\_join\_msg():719: Will never receive state. Need to abort.

Solution : stop iptables and restart mysql again.