**PXC集群配置**

**配置主机名与ip地址绑定**

[root@pxcnode71 ~]# vim /etc/hosts

......

192.168.4.71 pxcnode71

192.168.4.72 pxcnode72

192.168.4.73 pxcnode73

[root@pxcnode71 ~]# rsync -av /etc/hosts pxcnode72:/etc/

Warning: Permanently added 'pxcnode72' (ECDSA) to the list of known hosts.

root@pxcnode72's password:

sending incremental file list

hosts

sent 320 bytes received 41 bytes 103.14 bytes/sec

total size is 229 speedup is 0.63

[root@pxcnode71 ~]# rsync -av /etc/hosts pxcnode73:/etc/

Warning: Permanently added 'pxcnode73' (ECDSA) to the list of known hosts.

root@pxcnode73's password:

sending incremental file list

hosts

sent 320 bytes received 41 bytes 144.40 bytes/sec

total size is 229 speedup is 0.63

**pxcnode71、pxcnode72、pxcnode73都要安装软件包(以pxcnode71为例,软件包之间有依赖关系注意软件包安装顺序)**

[root@pxcnode71 ~]# rpm -ivh libev-4.15-1.el6.rf.x86\_64.rpm

[root@pxcnode71 ~]# yum -y install percona-xtrabackup-24-2.4.13-1.el7.x86\_64.rpm

[root@pxcnode71 ~]# rpm -ivh qpress-1.1-14.11.x86\_64.rpm

[root@pxcnode71 ~]# tar -xf Percona-XtraDB-Cluster-5.7.25-31.35-r463-el7-x86\_64-bundle.tar -C /opt/

[root@pxcnode71 ~]# cd /opt/

[root@pxcnode71 opt]# yum -y install Percona-XtraDB-Cluster-\*.rpm

**配置服务**

**pxcnode71、pxcnode72、pxcnode73都要修改mysqld.cnf文件(以pxcnode71为例)**

root@pxcnode71 ~]# vim /etc/percona-xtradb-cluster.conf.d/mysqld.cnf

......

[mysqld]

server-id=71 #server-id只要不允许重复,其它的都是默认的

datadir=/var/lib/mysql #数据库目录

socket=/var/lib/mysql/mysql.sock #socket文件

log-error=/var/log/mysqld.log #日志文件

pid-file=/var/run/mysqld/mysqld.pid #pid文件

log-bin #启用binlog日志

log\_slave\_updates #启用链式复制

expire\_logs\_days=7 #日志文件保留天数

......

修改3台mysqld\_safe.cnf文件(使用默认配置即可)

[root@pxcnode71 ~]# vim /etc/percona-xtradb-cluster.conf.d/mysqld\_safe.cnf

......

[mysqld\_safe]

pid-file = /var/run/mysqld/mysqld.pid

socket = /var/lib/mysql/mysql.sock

nice = 0

修改wsrep.cnf文件

分别修改3台服务器的wsrep.conf

[root@pxcnode71 ~]# vim /etc/percona-xtradb-cluster.conf.d/wsrep.cnf

8 wsrep\_cluster\_address=gcomm://192.168.4.72,192.168.4.73,192.168.4.71 #成员列表

25 wsrep\_node\_address=192.168.4.71 #本机ip

27 wsrep\_cluster\_name=pxc-cluster #集群名

30 wsrep\_node\_name=pxcnode71 #本机主机名

39 wsrep\_sst\_auth="sstuser:123qqq...A" #SST数据同步授权

[root@pxcnode72 ~]# vim /etc/percona-xtradb-cluster.conf.d/wsrep.cnf

8 wsrep\_cluster\_address=gcomm://192.168.4.71,192.168.4.73,192.168.4.72

25 wsrep\_node\_address=192.168.4.72

27 wsrep\_cluster\_name=pxc-cluster

30 wsrep\_node\_name=pxcnode72

39 wsrep\_sst\_auth="sstuser:123qqq...A"

[root@pxcnode73 ~]# vim /etc/percona-xtradb-cluster.conf.d/wsrep.cnf

8 wsrep\_cluster\_address=gcomm://192.168.4.71,192.168.4.72,192.168.4.73

25 wsrep\_node\_address=192.168.4.73 27 wsrep\_cluster\_name=pxc-cluster

30 wsrep\_node\_name=pxcnode73

39 wsrep\_sst\_auth="sstuser:123qqq...A"

启动集群服务(在一台服务上执行即可)

[root@pxcnode71 ~]# systemctl start mysql@bootstrap.service

[root@pxcnode71 ~]# grep password /var/log/mysqld.log

[root@pxcnode71 ~]# grep password /var/log/mysqld.log

2020-01-14T09:47:49.701286Z 1 [Note] A temporary password is generated for root@localhost: WI2qr?rSwsNA

[root@pxcnode71 ~]# mysql -uroot -p'WI2qr?rSwsNA'

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

Welcome to the MySQL monitor. Commands end with ; or \g.

Your MySQL connection id is 11

Server version: 5.7.25-28-57-log

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owners.

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

mysql> alter user root@localhost identified by '123456';

mysql> grant reload, lock tables, replication client, process on \*.\* to sstuser@localhost identified by '123qqq...A';

Query OK, 0 rows affected, 1 warning (0.09 sec)

pxcnode72、pxcnode73(以pxcnode71为例)都要启动数据库服务,会自动同步pxcnode71主机的root初始密码和授权用户sstuser

[root@pxcnode72 ~]# systemctl start mysql

[root@pxcnode72 ~]# netstat -utnlp | grep mysqld

tcp 0 0 0.0.0.0:4567 0.0.0.0:\* LISTEN 27163/mysqld

tcp6 0 0 :::3306 :::\* LISTEN 27163/mysqld

查看集群信息

在任意一台数据库查看都可以

[root@pxcnode71 ~]# mysql -uroot -p123456

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

Welcome to the MySQL monitor. Commands end with ; or \g.

Your MySQL connection id is 15

Server version: 5.7.25-28-57-log Percona XtraDB Cluster (GPL), Release rel28, Revision a2ef85f, WSREP version 31.35, wsrep\_31.35

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affiliates. Other names may be trademarks of their respective

owners.

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

mysql> show status like '%wsrep%';

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

| Variable\_name | Value |

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

| wsrep\_local\_state\_uuid | fc0c2d41-36b2-11ea-8f0c-bf5df7e9bf62 |

| wsrep\_protocol\_version | 9 |

| wsrep\_last\_applied | 2 |

| wsrep\_last\_committed | 2 |

| wsrep\_replicated | 2 |

| wsrep\_replicated\_bytes | 536 |

| wsrep\_repl\_keys | 2 |

| wsrep\_repl\_keys\_bytes | 64 |

| wsrep\_repl\_data\_bytes | 339 |

| wsrep\_repl\_other\_bytes | 0 |

| wsrep\_received | 7 |

| wsrep\_received\_bytes | 718 |

| wsrep\_local\_commits | 0 |

| wsrep\_local\_cert\_failures | 0 |

| wsrep\_local\_replays | 0 |

| wsrep\_local\_send\_queue | 0 |

| wsrep\_local\_send\_queue\_max | 1 |

| wsrep\_local\_send\_queue\_min | 0 |

| wsrep\_local\_send\_queue\_avg | 0.000000 |

| wsrep\_local\_recv\_queue | 0 |

| wsrep\_local\_recv\_queue\_max | 1 |

| wsrep\_local\_recv\_queue\_min | 0 |

| wsrep\_local\_recv\_queue\_avg | 0.000000 |

| wsrep\_local\_cached\_downto | 1 |

| wsrep\_flow\_control\_paused\_ns | 0 |

| wsrep\_flow\_control\_paused | 0.000000 |

| wsrep\_flow\_control\_sent | 0 |

| wsrep\_flow\_control\_recv | 0 |

| wsrep\_flow\_control\_interval | [ 173, 173 ] |

| wsrep\_flow\_control\_interval\_low | 173 |

| wsrep\_flow\_control\_interval\_high | 173 |

| wsrep\_flow\_control\_status | OFF |

| wsrep\_cert\_deps\_distance | 1.000000 |

| wsrep\_apply\_oooe | 0.000000 |

| wsrep\_apply\_oool | 0.000000 |

| wsrep\_apply\_window | 1.000000 |

| wsrep\_commit\_oooe | 0.000000 |

| wsrep\_commit\_oool | 0.000000 |

| wsrep\_commit\_window | 1.000000 |

| wsrep\_local\_state | 4 |

| wsrep\_local\_state\_comment | Synced |

| wsrep\_cert\_index\_size | 1 |

| wsrep\_cert\_bucket\_count | 22 |

| wsrep\_gcache\_pool\_size | 2208 |

| wsrep\_causal\_reads | 0 |

| wsrep\_cert\_interval | 0.000000 |

| wsrep\_open\_transactions | 0 |

| wsrep\_open\_connections | 0 |

| wsrep\_ist\_receive\_status | |

| wsrep\_ist\_receive\_seqno\_start | 0 |

| wsrep\_ist\_receive\_seqno\_current | 0 |

| wsrep\_ist\_receive\_seqno\_end | 0 |

| wsrep\_incoming\_addresses | 192.168.4.73:3306,192.168.4.72:3306,192.168.4.71:3306 |

| wsrep\_cluster\_weight | 3 |

| wsrep\_desync\_count | 0 |

| wsrep\_evs\_delayed | |

| wsrep\_evs\_evict\_list | |

| wsrep\_evs\_repl\_latency | 0/0/0/0/0 |

| wsrep\_evs\_state | OPERATIONAL |

| wsrep\_gcomm\_uuid | fbf4b5e4-36b2-11ea-9f59-129fa1175fa3 |

| wsrep\_cluster\_conf\_id | 3 |

| wsrep\_cluster\_size | 3 |

| wsrep\_cluster\_state\_uuid | fc0c2d41-36b2-11ea-8f0c-bf5df7e9bf62 |

| wsrep\_cluster\_status | Primary |

| wsrep\_connected | ON |

| wsrep\_local\_bf\_aborts | 0 |

| wsrep\_local\_index | 2 |

| wsrep\_provider\_name | Galera |

| wsrep\_provider\_vendor | Codership Oy <info@codership.com> |

| wsrep\_provider\_version | 3.35(rddf9876) |

| wsrep\_ready | ON |

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

71 rows in set (0.00 sec)

添加访问数据的连接用户(在任意一台服务器上添加都可以,另外的2台服务器会自动同步授权用户)

mysql> grant all on gamedb.\* to gzc@'%' identified by '123456';

Query OK, 0 rows affected, 1 warning (0.35 sec)

[root@pxcnode72 ~]# mysql -uroot -p123456 -e 'show grants for gzc@"%"'

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

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

| Grants for gzc@% |

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

| GRANT USAGE ON \*.\* TO 'gzc'@'%' |

| GRANT ALL PRIVILEGES ON `gamedb`.\* TO 'gzc'@'%' |

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

[root@pxcnode73 ~]# mysql -uroot -p123456 -e 'show grants for gzc@"%"'

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

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

| Grants for gzc@% |

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

| GRANT USAGE ON \*.\* TO 'gzc'@'%' |

| GRANT ALL PRIVILEGES ON `gamedb`.\* TO 'gzc'@'%' |

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

客户端连接集群存取数据(连接任意一台数据库服务器的ip地址都可以)

[root@room9pc01 ~]# mysql -h192.168.4.73 -ugzc -p123456

Welcome to the MariaDB monitor. Commands end with ; or \g.

Your MySQL connection id is 14

Server version: 5.7.25-28-57-log Percona XtraDB Cluster (GPL), Release rel28, Revision a2ef85f, WSREP version 31.35, wsrep\_31.35

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

MySQL [(none)]> create database gamedb;

Query OK, 1 row affected (0.22 sec)

MySQL [(none)]> create table gamedb.a(id int primary key auto\_increment, name char(10));

Query OK, 0 rows affected (1.16 sec)

MySQL [(none)]> insert into gamedb.a(name)values('bob'),('tom');

Query OK, 2 rows affected (0.23 sec)

Records: 2 Duplicates: 0 Warnings: 0

在另外2台数据库服务器查看数据

[root@room9pc01 ~]# mysql -h192.168.4.71 -ugzc -p123456 -e 'select \* from gamedb.a'

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

| id | name |

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

| 1 | bob |

| 4 | tom |

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

[root@room9pc01 ~]# mysql -h192.168.4.72 -ugzc -p123456 -e 'select \* from gamedb.a'

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

| id | name |

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

| 1 | bob |

| 4 | tom |

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

测试故障自动恢复

停止3台服务器的任意一台主机的数据库服务都不会影响数据的存取

[root@pxcnode71 ~]# systemctl stop [mysql@bootstrap.service](mailto:mysql@bootstrap.service)

[root@room9pc01 ~]# mysql -h192.168.4.72 -ugzc -p123456 -e 'insert into gamedb.a(name)values ("jerry"),(“mike”)'

[root@room9pc01 ~]# mysql -h192.168.4.73 -ugzc -p123456 -e 'select \* from gamedb.a'

启动pxcnode71主机的数据库服务

数据库服务运行后,会自动同步宕机期间的数据

[root@room9pc01 ~]# mysql -h192.168.4.71 -ugzc -p123456 -e 'select \* from gamedb.a'

部署LB集群

运行haproxy服务,接受客户端访问数据库的连接请求,把请求平均分发给3台PXC集群主机

安装软件

[root@haproxy99 ~]# yum -y install haproxy.x86\_64

修改配置文件

[root@haproxy99 ~]# vim /etc/haproxy/haproxy.cfg

......

63 listen status #定义监控页面

64 mode http #模式为http

65 bind \*:80 #端口80

66 stats enable #启用配置

67 stats uri /admin #访问目录名

68 stats auth admin:admin #登录用户与密码

69 listen mysql \*:3306 #定义haproxy服务名称与端口号

70 mode tcp #Mysq服务使用tcp协议

71 option tcpka #使用长连接

72 balance roundrobin #调度算法轮询

73 server mysql 192.168.4.71:3306 check#第一台数据库服务器

74 server mysql 192.168.4.72:3306 check#第二台数据库服务器

75 server mysql 192.168.4.73:3306 check#第三台数据库服务器

启动服务

[root@haproxy99 ~]# systemctl enable --now haproxy.service

Created symlink from /etc/systemd/system/multi-user.target.wants/haproxy.service to /usr/lib/systemd/system/haproxy.service.

[root@haproxy99 ~]# netstat -utnlp | grep haproxy

tcp 0 0 0.0.0.0:3306 0.0.0.0:\* LISTEN 1130/haproxy

tcp 0 0 0.0.0.0:80 0.0.0.0:\* LISTEN 1130/haproxy

udp 0 0 0.0.0.0:54744 0.0.0.0:\* 1129/haproxy

测试配置

[root@room9pc01 ~]# mysql -h192.168.4.99 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode71 | #第一次连接

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

[root@room9pc01 ~]# mysql -h192.168.4.99 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode72 | #第二次连接

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

[root@room9pc01 ~]# mysql -h192.168.4.99 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode73 | #第三次连接

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

部署HA集群

准备备用调度器主机haproxy98

安装软件haproxy

[root@haproxy98 ~]# yum -y install haproxy.x86\_64

修改haproxy98主机haproxy.conf文件(直接拷贝haproxy99主机的配置文件即可)

[root@haproxy98 ~]# rsync -av 192.168.4.99:/etc/haproxy/haproxy.cfg /etc/haproxy/

Warning: Permanently added '192.168.4.99' (ECDSA) to the list of known hosts.

root@192.168.4.99's password:

receiving incremental file list

haproxy.cfg

sent 73 bytes received 987 bytes 302.86 bytes/sec

total size is 2,978 speedup is 2.81

启动服务

[root@haproxy98 ~]# systemctl enable --now haproxy.service

Created symlink from /etc/systemd/system/multi-user.target.wants/haproxy.service to /usr/lib/systemd/system/haproxy.service.

[root@haproxy98 ~]# netstat -utnlp | grep haproxy

tcp 0 0 0.0.0.0:3306 0.0.0.0:\* LISTEN 1120/haproxy

tcp 0 0 0.0.0.0:80 0.0.0.0:\* LISTEN 1120/haproxy

udp 0 0 0.0.0.0:54558 0.0.0.0:\* 1119/haproxy

安装软件keepalived

[root@haproxy99 ~]# yum -y install keepalived.x86\_64

[root@haproxy98 ~]# yum -y install keepalived.x86\_64

修改配置文件

[root@haproxy99 ~]# vim /etc/keepalived/keepalived.conf

1 ! Configuration File for keepalived

2

3 global\_defs {

4 notification\_email {

5 acassen@firewall.loc

6 failover@firewall.loc

7 sysadmin@firewall.loc

8 }

9 notification\_email\_from Alexandre.Cassen@firewall.loc

10 smtp\_server 192.168.200.1

11 smtp\_connect\_timeout 30

12 router\_id LVS\_DEVEL

13 vrrp\_skip\_check\_adv\_addr

14 vrrp\_strict

15 vrrp\_garp\_interval 0

16 vrrp\_gna\_interval 0

17 vrrp\_iptables #禁止iptables

18 }

19

20 vrrp\_instance VI\_1 {

21 state MASTER #主服务器标识

22 interface eth0

23 virtual\_router\_id 51

24 priority 150 #haproxy99主机做主服务器,优先级要比haproxy98主机高

25 advert\_int 1

26 authentication {

27 auth\_type PASS #主备服务器连接方式

28 auth\_pass 1111 #连接密码

29 }

30 virtual\_ipaddress {

31 192.168.4.100 #定义vip地址

32 }

33 }

[root@haproxy99 ~]# rsync -av /etc/keepalived/keepalived.conf root@192.168.4.98:/etc/keepalived/

Warning: Permanently added '192.168.4.98' (ECDSA) to the list of known hosts.

root@192.168.4.98's password:

sending incremental file list

keepalived.conf

sent 972 bytes received 71 bytes 298.00 bytes/sec

total size is 872 speedup is 0.84

修改haproxy98主机的配置文件

[root@haproxy98 ~]# vim /etc/keepalived/keepalived.conf

......

17 vrrp\_iptables #禁止iptables

18 }

19

20 vrrp\_instance VI\_1 {

21 state BACKUP #主服务器标识

22 interface eth0

23 virtual\_router\_id 51

24 priority 100 #优先级要比haproxy99主机低

25 advert\_int 1

26 authentication {

27 auth\_type PASS #主备服务器连接方式

28 auth\_pass 1111 #连接密码

29 }

30 virtual\_ipaddress {

31 192.168.4.100 #定义vip地址

32 }

33 }

启动服务

[root@haproxy99 ~]# systemctl enable --now keepalived.service

Created symlink from /etc/systemd/system/multi-user.target.wants/keepalived.service to /usr/lib/systemd/system/keepalived.service.

[root@haproxy99 ~]# ip a s | grep 192.168.4.100

inet 192.168.4.100/32 scope global eth0

[root@haproxy98 ~]# systemctl enable --now keepalived.service

Created symlink from /etc/systemd/system/multi-user.target.wants/keepalived.service to /usr/lib/systemd/system/keepalived.service.

[root@haproxy98 ~]# ip a s |grep 192.168.4.100

测试配置

客户端连接vip地址,访问数据库服务

[root@room9pc01 ~]# mysql -h192.168.4.100 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode71 |

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

[root@room9pc01 ~]# mysql -h192.168.4.100 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode72 |

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

[root@room9pc01 ~]# mysql -h192.168.4.100 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode73 |

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

测试高可用

[root@haproxy99 ~]# ip a s | grep 192.168.4.100 #在haproxy99主机查看vip地址

inet 192.168.4.100/32 scope global eth0

[root@haproxy98 ~]# ip a s | grep 192.168.4.100

[root@haproxy99 ~]# systemctl stop keepalived.service #停止keepalived服务

[root@haproxy99 ~]# ip a s | grep 192.168.4.100 #查看不到vip

[root@haproxy98 ~]# ip a s | grep 192.168.4.100 #在备用服务器haproxy98主机查看地址

inet 192.168.4.100/32 scope global eth0

客户端连接vip地址依然可以访问数据库服务

[root@room9pc01 ~]# mysql -h192.168.4.100 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode71 |

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

[root@room9pc01 ~]# mysql -h192.168.4.100 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode72 |

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

[root@room9pc01 ~]# mysql -h192.168.4.100 -ugzc -p123456 -e 'select @@hostname'

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

| @@hostname |

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

| pxcnode73 |

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