

# Greenplum 集群 Master 与 Standby 相互切换

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## 1 概述

本文档主要测试 Greenplum 集群的 Master 与 Standby 节点异常后数据同步问题，之相互切换的过程。在操作时通过手动停掉 Master 节点看 Standby 节点是否能正常的启动，期间是否有数据不同步的问题，再通过恢复原 Master 节点查看集群是否正常运行。在切换期间要注意 Master 与 Standby 脑裂的情况的发生。

## 2 查看集群的基本信息

以下命令全部在 Master 节点上操作

### 2.1 查看集群的配置信息

查看集群的 mirror 配置及同步状态

```
gpstate -m
```

查看集群的 primary 与 mirror 的安装目录及端口

```
gpstate -p
```

### 2.2 快速查看 down segments 节点

```
gpstate -s
```

### 2.3 查看 Master Standby 节点的运行状态

```
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:- Standby address =
smdw
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:- Standby data directory =
/data/master/gpseg-1
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:- Standby port
= 5432
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:- Standby PID
= 125235
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:- Standby status =
Standby host passive
20201012:16:05:59:070782
gpstate:gpmaster:gpadmin-[INFO]:-----
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:--pg_stat_replication
20201012:16:05:59:070782
gpstate:gpmaster:gpadmin-[INFO]:-----
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:--WAL Sender State: streaming
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:--Sync state: sync
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:--Sent Location: 0/EF0B8570
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:--Flush Location: 0/EF0B8570
20201012:16:05:59:070782 gpstate:gpmaster:gpadmin-[INFO]:--Replay Location: 0/EF0A7948
```

20201012:16:05:59:070782

gpstate:gpmaster:gpadmin-[INFO]:-----

注意以上标红的信息，特别留意每次元数据改变 **Sent Location / Flush Location / Replay Location** 值的变化。

## 2.4 查看 Master 与 Master Standby 的配置

查看 master 的环境变量信息

```
cat ~/.bash_profile
```

\*\*\*\*\*

```
# greenplum  config info
source /usr/local/greenplum-db/greenplum_path.sh
export MASTER_DATA_DIRECTORY=/data/master/gpseg-1
export GPPORT=5432
export PGPORT=5432
export PGDATABASE=123456
```

查看 Master Standby 的配置

```
cat ~/.bash_profile
```

\*\*\*\*\*

```
# greenplum  config info
source /usr/local/greenplum-db/greenplum_path.sh
export MASTER_DATA_DIRECTORY=/data/master/gpseg-1
export GPPORT=5432
export PGPORT=5432
export PGDATABASE=123456
```

## 3 移除掉 Standby 节点

### 3.1 移除掉 Standby 节点

```
[gpadmin@gpmaster ~]$ gpinitstandby -r
```

```

20201015:11:17:54:199737
gpinitstandby:gpmaster:gpadmin-[INFO]:-----
20201015:11:17:54:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Warm master standby
removal parameters
20201015:11:17:54:199737
gpinitstandby:gpmaster:gpadmin-[INFO]:-----
20201015:11:17:54:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Greenplum master
hostname = gpmaster
20201015:11:17:54:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Greenplum master data
directory = /data/master/gpseg-1
20201015:11:17:54:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Greenplum master port
= 5432
20201015:11:17:54:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Greenplum standby master
hostname = gpsdw1
20201015:11:17:54:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Greenplum standby master
port = 5432
20201015:11:17:54:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Greenplum standby master
data directory = /data/master/gpseg-1
Do you want to continue with deleting the standby master? Yy|Nn (default=N):
> y
20201015:11:18:04:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Removing standby master
from catalog...
20201015:11:18:04:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Database catalog updated
successfully.
20201015:11:18:04:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Stopping standby master
on gpsdw1
20201015:11:18:04:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Removing data directory
on standby master...
20201015:11:18:06:199737 gpinitstandby:gpmaster:gpadmin-[INFO]:-Successfully removed
standby master

```

## 3.2 查看 Standby 的配制

```

[gpadmin@gpmaster ~]$ gpstate -f
20201015:11:18:17:199788 gpstate:gpmaster:gpadmin-[INFO]:-Starting gpstate with args: -f
20201015:11:18:17:199788 gpstate:gpmaster:gpadmin-[INFO]:-local Greenplum Version:
'postgres (Greenplum Database) 6.1.0 build
commit:6788ca8c13b2bd6e8976ccffea07313cbab30560'
20201015:11:18:17:199788 gpstate:gpmaster:gpadmin-[INFO]:-master Greenplum Version:
'PostgreSQL 9.4.24 (Greenplum Database 6.1.0 build
commit:6788ca8c13b2bd6e8976ccffea07313cbab30560) on x86_64-unknown-linux-gnu,

```

```
compiled by gcc (GCC) 6.4.0, 64-bit compiled on Nov  1 2019 22:06:07'
20201015:11:18:17:199788 gpstate:gpmaster:gpadmin-[INFO]:-Obtaining Segment details from
master...
20201015:11:18:17:199788 gpstate:gpmaster:gpadmin-[INFO]:-Standby master instance not
configured
20201015:11:18:17:199788
gpstate:gpmaster:gpadmin-[INFO]:-----
20201015:11:18:17:199788 gpstate:gpmaster:gpadmin-[INFO]:--pg_stat_replication
20201015:11:18:17:199788
gpstate:gpmaster:gpadmin-[INFO]:-----
20201015:11:18:17:199788 gpstate:gpmaster:gpadmin-[INFO]:-No entries found.
20201015:11:18:17:199788
gpstate:gpmaster:gpadmin-[INFO]:-----
```

## 4 在 Master 节点上创建表

### 4.1 创建一张测试表

```
[gpadmin@gpmaster ~]$ psql -d postgres
psql (9.4.24)
Type "help" for help.

postgres=# create table test (id int) DISTRIBUTED BY(id);
CREATE TABLE
postgres=# insert into test select generate_series(1,50000,1);
INSERT 0 50000
postgres=# select count(*) from test;
 count
-----
 50000
(1 row)
```

创建了一张 test 表并插入到 5W 数据。

## 5 添加 Standby 节点

在 master 上执行添加 standby 操作，并查看添加后时候即使同步了元数据信息。

## 5.1 添加 Standby 节点

```
[gpadmin@gpmaster ~]$ gpinitstandby -s smdw
```

smdw : standby 节点的主机名字

## 5.2 查看 Standby 信息

```
[gpadmin@gpmaster ~]$ gpstate -f
```

```
*****
20201015:12:16:09:207211 gpstate:gpmaster:gpadmin-[INFO]:--pg_stat_replication
20201015:12:16:09:207211
gpstate:gpmaster:gpadmin-[INFO]:-----
20201015:12:16:09:207211 gpstate:gpmaster:gpadmin-[INFO]:--WAL Sender State: streaming
20201015:12:16:09:207211 gpstate:gpmaster:gpadmin-[INFO]:--Sync state: sync
20201015:12:16:09:207211 gpstate:gpmaster:gpadmin-[INFO]:--Sent Location: 1/2800DE68
20201015:12:16:09:207211 gpstate:gpmaster:gpadmin-[INFO]:--Flush Location: 1/2800DE68
20201015:12:16:09:207211 gpstate:gpmaster:gpadmin-[INFO]:--Replay Location: 1/2800DDB0
20201015:12:16:09:207211
gpstate:gpmaster:gpadmin-[INFO]:-----
```

在以上可以看到数据已经元数据已经更新为了 2800DDB0 版本了说明元数据以及时更新了。

## 5.3 查看 Master 与 Standby 同步的进程信息

```
[gpadmin@gpmaster ~]$ ps -ef|grep streaming
gpadmin  204223 204143  0 12:06 ?          00:00:04 postgres: 7001, wal receiver process
streaming 1/1DF892A8
gpadmin  204224 204150  0 12:06 ?          00:00:00 postgres: 6001, wal sender process
gpadmin 192.168.58.16(21448) streaming 1/1E361700
gpadmin  204225 204148  0 12:06 ?          00:00:00 postgres: 6002, wal sender process
gpadmin 192.168.58.16(38264) streaming 1/1E16D648
gpadmin  204226 204146  0 12:06 ?          00:00:04 postgres: 7002, wal receiver process
streaming 1/1DF7BB18
gpadmin  204227 204149  0 12:06 ?          00:00:00 postgres: 6000, wal sender process
gpadmin 192.168.58.16(12705) streaming 1/1E839380
```

```

gpadmin 204228 204147 0 12:06 ? 00:00:00 postgres: 6003, wal sender process
gpadmin 192.168.58.16(34466) streaming 1/1DB314C0
gpadmin 204229 204145 0 12:06 ? 00:00:04 postgres: 7003, wal receiver process
streaming 1/1E1C8B90
gpadmin 204231 204144 0 12:06 ? 00:00:04 postgres: 7000, wal receiver process
streaming 1/1EAD05F8
gpadmin 207140 204234 0 12:15 ? 00:00:00 postgres: 5432, wal sender process
gpadmin 192.168.58.16(53979) streaming 1/293CB8B0
gpadmin 227768 201661 0 14:06 pts/23 00:00:00 grep --color=auto streaming

```

在以上可以看出 master 以 sender process 进程向 standby 发送 WAL 同步日志。Standby 节点正在以 wal receiver process 进程接受 WAL 日志。

## 6 移除掉 Master 节点

### 6.1 移除掉 Master 节点

```

$ pg_ctl stop -D /data/master/gpseg-1
waiting for server to shut down.... done
server stopped

```

### 6.2 查看移除后的集群状态

```

$ gpstate -f
*****

Is the server running on host "localhost" (::1) and accepting
TCP/IP connections on port 5432?
could not connect to server: Connection refused
Is the server running on host "localhost" (127.0.0.1) and accepting
TCP/IP connections on port 5432?
') exiting...

```

## 7 把 Standby 节点升级为 Master

### 7.1 把 Standby 节点升级为 Master

在 standby 节点上执行以下命令

```
$ gpactivatestandby -d /data/master/gpseg-1
```

### 7.2 查看切换后的集群的状态

```
$ gpstate -s
```

```
*****
***** Master host = smdw
***** Master postgres process ID = 208590
***** Master data directory = /data/master/gpseg-1
***** Master port = 5432
***** Master current role = dispatch
***** Greenplum initssystem version = 6.1.0 build
commit:6788ca8c13b2bd6e8976ccffea07313cbab30560
***** Postgres version = 9.4.24
***** Master standby = No master standby configured
```

### 7.3 查看创建的表

```
postgres=# select count(*) from test;
count
-----
50000
(1 row)
```



## 8 把当前的 Master 再次切换成 Standby

### 8.1 添加 Standby 节点

在原始 master 机器上备份 master 数据的目录

```
$ mv /data/master/gpseg-1 /data/master/gpseg-1-back
```

在当前的 master 的节点上执行以下命令

```
$ gpinitstandby -s mdw
```

```
*****
```

```
[INFO]:-Successfully created standby master on gpmaster
```

### 8.2 关闭掉当前的 master 节点

```
$ pg_ctl stop -D /data/master/gpseg-1
```

```
waiting for server to shut down.... done
```

```
server stopped
```

### 8.3 把 Standby 节点激活为 Master 节点

```
$ gpactivatestandby -d /data/master/gpseg-1
```

### 8.4 查看激活后的集群的配置

```
$ gpstate -s
```

### 8.5 备份当前 Master 节点的数据

在当前 master 机器上备份 master 数据的目录

```
$ mv /data/master/gpseg-1 /data/master/gpseg-1-back
```

## 8.6 添加 Standby 节点

```
$ gpinitstandby -s smdw
```

## 8.7 查看添加之后的集群的配置

```
$ gpstate -f
```