# Greenplum 集群之间同步数据方法及性能

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# 1 概述

Greenplum 数据同步包括相同集群不同 schema 之间的数据同步,包括相同集群不同数据库之间的同步,也包括不同数据库之间的数据,同步包括数据同步,函数同步,用户同步等,接下来不要太多的语言就要干,不要怂、、、、、

# 2 相同集群相同数据库不同 SCHEMA 之间 同步数据

# 2.1 查看原始表的大小行数与结构

```
原始数据的大小
select pg_size_pretty(pg_relation_size('dim.test1'));
-- 43 GB
原始数据的行数
select count(*) from dim.test1;
-- 182,683,056
原始数据的表结构
stagging=# \d dim.test1;
                Table "dim.test1"
  Column |
                                       | Modifiers
                        Type
           | character varying(500) |
 encode_v1 | character varying(500) |
 encode_v2 | character varying(500) |
Distributed by: (zspid)
```

### 2.2 同步语句

create table ods.test1 with (appendonly = true, compresstype = zlib, compresslevel = 5, orientation=column, checksum = false, blocksize = 2097152) as select zspid, encode\_v1, encode\_v2 from dim.test1

Distributed by (zspid);

#### 参数的含义请查看:

https://mp.weixin.qq.com/s? biz=MzUxNzY0MDg20Q==&mid=2247484195&idx=1&sn=5785c2e3bba2125b173c9ddf8a1a4f99&chksm=f99444e9cee3cdff

# 2.3 查看 cpu 与内存的使用情况

### 2.3.1 查看 Master CPU 与内存使用情况

```
CPU Utilisation
CPU User%
                      Idle | 0
                                                                         1001
                0.0 98.01
     1.0
           0.0
                 0.0
                      99.01
           0.5
                 0.0
                      98.51
     0.5
                 0.0
                      99.01
     1.0
                 0.0 99.01
                 0.0 98.01>
                 0.0 98.51
                 0.0 98.5| >
0.0 98.5|
           0.5
           0.5
                     99.51 >
     0.5
           0.0
     1.0
                     99.01
     0.5
               0.0 99.01 >
     0.9
                 RAM-Memory Swap-space
                                                           Low-Memory
Total in MB
                                16384.0
                                                          - not in use
                                 16383.8
Free in MB
                                  100.0%
Free Percent
Disk I/O -/proc/diskstats-
                              mostly in KB/s-
                                                 -Warning:contains duplicates
DiskName Busy Read WriteKB|0
                                                                         1001
           0%
sdal
          0%
                       0.01>
sda2
                0.0 187.81
         Warning: Some Statistics may not
```

# 2.3.2 查看数据节点的 CPU 使用情况

数据节点一使用情况

```
nmon-16d-
                                -Hostname=gpsdwl---
                                                         -Refresh= 2secs ---14:40.05-
CPU Utilisation
CPU User%
                         Idle|0
                                                                                    100|
                         94.41
     98.5
                          0.01
             2.0
     98.0
                          0.01
     98.5
                          0.01
     97.5
             2.5
                    0.0
                          0.01
                         98.01
                         99.5|
97.0|
                    0.5
             2.0
      0.5
                    0.5
                         96.51
             2.5
      0.5
                    0.5
                         96.41
                         95.51
             2.5
                         0.0|<mark>0</mark>
97.5|
     97.5
                    0.0
             2.5
                    0.5
                         96.01
     99.0
             3.5
                         95.51
     98.5
                          0.01
                         98.01
      0.5
             2.5
                    0.5
                         96.51
                         94.91
             4.0
                    0.5
                          0.01
     98.5
             1.5
22
                    0.0
                         98.01
     98.5
                          0.01
24
             0.5
                    0.5
                         99.01
     98.5
      0.5
             2.5
                    0.5
                         96.51
     98.5
```

数据节点二使用情况

nmor	1-16d-				-Hostname=gr	sdw2-	Refresh=	2secs1	4:40.37-
CPU	Utili	sation	1						
									+
	User*			Idle		25	150	175	100
1	98.5	1.5	0.0	0.01	0000000000000	00000000		100000000000000000000000000000000000000	>0000000
2	1.0	7.2	26.3	65.5			>		
3	0.5	1.0	18.0	80.5					
4	0.5	5.0	9.5	84.9		>			
5	0.5	1.5	14.0	84.0					
6	0.0	1.5	0.0	98.51		>			
7	0.0	0.0	0.0	100.0	>				
8	0.5	1.0	14.6	83.91	WWWWWW		>		
9	99.0	1.0	0.0		<u> </u>	וטטטטטטטט	וטטטטטטטטטטטט	וטטטטטטטטטטט	
10	0.5	1.5	18.5	79.51	MANAGEMENT OF THE	>			1
11	98.5	1.5	0.0	0.01	UUUUUUUUUUUUU	TOUUUUUUU	, <mark>DOUDODODODO</mark>	וטטטטטטטטטטט	<u> </u>
12	98.0	2.0	0.0	0.01	UUUUUUUUUUUUUU	וטטטטטטטטט	וטטטטטטטטטטטט	וטטטטטטטטטטט	
13	0.5	3.0	30.0	66.5			>		
14	0.0	2.5	10.5	87.01			>		
15	98.0	2.0	0.0	0.01	וטטטטטטטטטטטט	UUUUUUUUU	JUUUUUUUUUUUUUUUU	וטטטטטטטטטטט	טטטטטטטט>
16	97.5	2.5	0.0	0.0	UUUUUUUUUUUUU	TUUUUUUUU	JUUUUUUUUUUUUUUU	וטטטטטטטטטטט	JUUUUUU <mark>s</mark> >
17	0.5	1.0	16.5	82.01					
18	0.5	1.0	13.5	85.01					
19	0.0	0.5	0.0	99.51					
20	0.0	1.0	5.5	93.51		5			
21	99.0	1.0	0.0	0.01	UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	TUUUUUUUU	וטטטטטטטטטטטט	וטטטטטטטטטטט	טטטטטטטט>
22	98.0	2.0	0.0	0.01	UUUUUUUUUUUUUU	יטטטטטטטטט	וטטטטטטטטטטטט	וטטטטטטטטטטט	>טטטטטטטט
23	0.0	0.5	19.2	80.31			>		
24	0.5	2.0	24.0	73.51				>	
25	99.0	1.0	0.0	0.01	<del>000000000000</del>	UUUUUUUU	JUUUUUUUUUUUUU	וטטטטטטטטטטט	
26	98.0	2.0	0.0	0.01	UUUUUUUUUUUUUU	יטטטטטטטטט	JUUUUUUUUUUUUUU	וטטטטטטטטטטט	
27	1.0	1.0	14.5	83.51	MMMMMM		>		
28	0.0	1.0	14.0	85.01			>		
29	0.5	1.5	5.0	93.01					
30	98.0	2.0	0.0	0.01	זטטטטטטטטטטט	וטטטטטטטט	וטטטטטטטטטטטט	וטטטטטטטטטט	
31	1 5	3 5	26 5	68 51	and the second second	Tattal			

数据节点三使用情况

```
CPU Utilisation
CPU User%
                     Idle | 0
                                                                      1001
     0.0
           0.0
               72.9 27.1|
70.9 29.1|
73.5 26.0|
 2
     0.0
           0.0
     0.0
           0.0
     0.0
           0.5
     0.0
           0.0
                0.0 100.0|>
                    13.11
     0.5
           4.5
                0.0 100.01
     0.0
           0.0
     0.0
           2.5
               84.4 13.11
     0.0
           0.0
               66.5
                    33.51
     0.0
           1.0
               73.6 25.41
                0.0 100.0|>
12
     0.5
               98.5 0.01
     0.0
          0.0
                0.0 100.0|>
          0.0
                0.0 99.5
14
     0.5
     0.0
           0.0
                0.0 100.01
                0.0 100.01
16
     0.0
           0.0
17
                0.0 100.0|>
           0.0
           0.5
               73.5 25.51
     0.5
                0.0 100.01
19
     0.0
           0.0
20
                0.0 100.01
     0.0
           0.0
     0.0
           0.5
               0.0 99.5|>
           1.5 98.5
     0.0
                     0.01
     0.0
24
           1.5 98.5 0.01
     0.0
     0.0
          0.0
                0.0 100.0|>
               37.8 61.21
26
     0.5
           0.5
                0.0 100.01
27
     0.0
           0.0
                0.0 100.0|
     0.0
           0.0
29
                0.0 100.0|>
     0.0
           0.0
               78.9
                    21.11
     0.0
           0.0
                0.0 100.0|>
     0.0
           0.0
```

# 2.3.3 查看数据节点的内存与磁盘使用情况

数据节点一使用情况

```
-- Refresh= 2secs --- 14:41.13
Memory and Swap
Total in MB
                                    16384.0
                                                                  - not in use
Free in MB
Free Percent
                                    16325.3
                                       99.6%
Disk I/O -/proc/diskstats
                                                       Warning:contains duplicates
                Read WriteMB|0
0.0 332.0
DiskName Busy
sda
         100%
                          0.01>
sdal
           0%
sda2
sda3
         100%
dm-0
          41%
dm-1
         100%
                            Writes-Mb/s=998.1
Totals Read-MB/s=0.0
                                                    Transfers/sec=4164.1
```

#### 数据节点二使用情况

```
-[H for help]—Hostname=gpsdw2——Refresh= 2secs —14:41.39
Memory and Swap
                   RAM-Memory
                                 Swap-space
                                                                  Low-Memory
 Total in MB
                                    16384.0
                                                                 - not in use
 Free in MB
                                      100.0%
 Free Percent
Disk I/O -/proc/diskstate
                                  mostly in KB/s-
                                                      -Warning:contains duplicates
DiskName Busy Read WriteKB|0

sda 1% 0.0 12.0.6|W

sda1 0% 0.0 0.0|>
                                                                                  1001
sda2
                  0.0 1240.61W
sda3
dm-0
dm-1
                            .01
            1%
                  0.0 1256.5|W
                            .5|W O
Writes-MB/s=3.7
dm-2
Totals Read-MB/s=0.0
                                                    Transfers/sec=175.8
```

#### 数据节点三使用情况

```
Memory and Swap
                                                                 Low-Memory
 Total in MB
                                                                - not in use
Free in MB
Free Percent
Disk I/O
            -/proc/diskstats
                                -mostly in KB/s
                                                     -Warning:contains duplicates
DiskName Busy Read WriteKB
                  0.0 3841.// WWW
           48
sda
sdal
sda2
           0%
sda3
                  0.0 3841.7
dm-0
dm-1
           0%
           48
                           Whites-MB/s=11.3
Totals Read-MB/s=0.0
                                                  Transfers/sec=504.9
```

# 2.4 查看耗时与表的大小

#### 查看耗时

```
create table ods.test1 with (appendonly = true, compresstype = zlib, compresslevel = 5, orientation=column, checksum = false, blocksize = 2097152) as select zspid, encode_v1, encode_v2 from dim.test1

Distributed by (zspid);
```

时间: 108.063s

受影响的行: 182683056

```
查看表的大小
select pg_size_pretty(pg_relation_size('ods.test1'));
-- 27 GB
```

在以上可以看出耗时 108.063s 同步了 27G 的数据, 大约 256M / S

# 3 相同集群不同数据库之间同步数据

# 3.1 使用 pg\_dum 方式同步数据

# 3.1.1 查看原始表的信息

```
原始数据的大小
select pg_size_pretty(pg_relation_size('dim.test1'));
-- 43 GB
原始数据的行数
select count(*) from dim.test1;
-- 182,683,056
原始数据的表结构
stagging=# \d dim.test1;
                Table "dim.test1"
  Column |
                                      | Modifiers
                        Type
           | character varying(500) |
 encode_v1 | character varying(500) |
 encode_v2 | character varying(500) |
Distributed by: (zspid)
```

### 3.1.2 把数据下载到磁盘

### 3.1.2.1 下载数据语句

```
$ time pg_dump -h 192.168.***.** -p 5432 -t dim.test1 -U gpadmin stagging -f test1.sql real 1m58.278s user 0m10.242s sys 1m5.665s
```

下载到磁盘大约用时 1m58.278s

# 3.1.2.2 查看 Master 节点详细信息

```
[H for help] — Hostname=gpmdw
                                                     -Refresh= 2secs ---15:13.13
CPU Utilisation
                        Idle | 0
                                                                              1001
CPU User%
     52.2
           37.3
                   0.0
                        10.4
      1.0
            2.0
                   0.0
                        97.01
           37.8
                   0.0
                        54.41
            9.6
                  37.9
                        52.01
                  6.2
                        79.21
                        68.81
            6.5
                  23.6
      8.6
            8.6
                  0.0
                        82.71
      0.5
            4.0
                  11.6
                        83.81
      2.1
                        90.61
      0.5
            3.5
                   8.6
                        91.8
      1.6
            3.8
                   1.0
                        98.01
           10.9
                        74.61
Avg
Memory and Swap
                               Swap-space
                                                                Low-Memory
 Total in MB
                                   16384.0
                                   16383.8
 Free in MB
                                     100.0%
 Free Percent
            -/proc/diskstats
Disk I/O
                                mostly in KB/s
                                                    Warning:contains duplicates
DiskName Busy
               Read Write
sda
         100%
                      481.31
sdal
                         0.01>
sda2
           08
sda3
         100%
```

# 3.1.3 把数据导入到数据库中

# 3.1.3.1 导入数据库语句

```
$ time psql -h 192.168.***.** -p 5432 -Ugpadmin stagging -f test1.sql
SET
SET
SET
SET
SET
SET
SET
SET
SET
CREATE TABLE

real 20m33.675s
user 0m58.438s
sys 0m33.612s
```

在以上可以看出导入数据耗时 20m33.675s

### 3.1.3.2 查看 Master 节点的详细信息

```
CPU Utilisation
                     Idle | 0
     1.5
                0.0
                     98.01
                0.0 99.01
     0.5
     0.5
           0.0
                     91.5|<del>00</del>
     5.5
           3.0
     1.5
           0.5
                     99.5|
     0.5
     0.5
     0.5
           0.5
                0.0 99.01
                     99.01
                     99.01
     0.5
           0.5
     0.5
           0.5
                0.0
Avg
     3.5
          1.0
                0.0 95.5
Memory and Swap
                RAM-Memory Swap-space
128693.6 16384.0
                                                        Low-Memory
Total in MB
Free in MB
                    54536.7
                               16383.8
Free Percent
Disk I/O -/proc/diskstats-
                            mostly in KB/s-
                                              -Warning:contains duplicates
DiskName Busy Read WriteKB|0
                                                                     1001
sda
         0%
sdal
                     0.01>
sda2
sda3
          0%
               0.0 26.01
        Warning: Some Statistics may not shown
```

### 3.1.3.3 查看数据节点的详细信息

数据节点一的详细信息

```
nmon-16d-
                       Memory and Swap
               RAM-Memory Swap-space High-Memory Low-Memory 354484.7 16384.0 - not in use - not in use
Total in MB 822.2
Free in MB 822.2
              354484.7 16384.0
                             16325.1
 Free Percent 0.2% 99.6%

Linux Kernel Internal Memory (MB)

Cached= 337142.8 Active= 225211.3

Buffers= 0.1 Swapcached= 0.3 Inactive = 120553.9

Dirty = 1195.8 Writeback = 22.7 Mapped = 7404.9

Slab = 4691.0 Commit_AS = 33310.2 PageTables= 227.1
0.0 0.0|>
sdal
sda2
        0%
                    0.01>
       sda3
dm-0
dm-1
         0%
       dm-2
                                         Transfers/sec=4342.0
Totals Read-MB/s=330.6 Writes-MB/s=497.9
```

#### 数据节点二的详细信息

```
Memory and Swap
                                          High-Memory Low-Memory - not in use - not in use
                 RAM-Memory Swap-space
Total in MB 386740.7 16384.0
Free in MB 949.3 16383.1
Free Percent 0.28 100.08
 Free Percent 0.2% 100.0%

Linux Kernel Internal Memory (MB)

Cached= 372112.6 Active= 295225.8

Buffers= 0.1 Swapcached= 0.0 Inactive= 81816.0

Dirty = 1015.4 Writeback = 65.9 Mapped = 7412.5

Slab = 5335.6 Commit_AS = 27489.0 PageTables= 210.3
Disk I/O -/proc/diskstats-mostly in KB/s-Warning:contains duplicates
sdal
sda2
sda3
dm-0
         0%
                     0.01>
dm-1
        dm-2
Totals Read-MB/s=262.2 Writes-MB/s=583.4
                                           Transfers/sec=3846.9
```

数据节点三的详细信息

# 3.1.4 验证数据的准确性

```
select pg_size_pretty(pg_relation_size('dim.test1'));
-- 43 GB
select count(*) from dim.test1;
-- 182683056
```

在以上可以看出数据完好

# 3.1.5 pg\_dump 同步数据总结

在以上可以看出 pg\_dump 命令在导出时速度还是比较快的,在导入时比较慢,此工具适合于备份用。

# 3.2 使用 dblink 同步数据

# 3.2.1 dblink 同步相同集群不同数据库的数据

## 3.2.1.1 同步语句

```
drop table if exists dim.test1;
create table dim.test1 with (appendonly = true, compresstype = zlib, compresslevel = 5
```

,orientation=column, checksum = false,blocksize = 2097152) as
select \* from dblink('hostaddr=192.168.\*\*\*.\*\* port=5432 dbname=chin\*\*\* password=\*\*\*\*\*',
'SELECT zspid,encode\_v1,encode\_v2 FROM dim.dim\_cif\_indmap\_xiaoxu')
AS dbltab(zspid character varying(500),encode\_v1 character varying(500),encode\_v2 character varying(500))
DISTRIBUTED BY (zspid);

时间: 1631.477s

受影响的行:0

受影响的行: 182683056

在以上可以看出用时 1631.477s, 大约需要 27m, 简直太慢,不可行

### 3.2.1.2 查看 Master 节点的详细信息

```
-Hostname=gpmdw-
                                                                               -Refresh= 2secs ---17:19.30
CPU Utilisation
                           0.0 97.0|0
        2.5
                           0.0 98.51
                                  95.510
        3.0
                  1.5
                           0.0
                                   80.0|<mark>0000000</mark>
                  8.0
                           33.8
                  1.0
                                   98.01
         2.5
                                   95.510
                            0.0 98.51
        2.5
                                   96.51
                 1.0
                           0.0
                12.0
                           0.0 39.01
       49.0
         2.0
                           0.0 97.0
         1.0
                  0.5
                           0.0 98.5
         9.2
                           0.0 87.410000
Memory and Swap
                           RAM-Memory
                                                                                             Low-Memory
 Total in MB
                                                   16384.0
                                                                                            - not in use
 Free in MB
                                                   16383.8
 Free Percent
             Recv=KB/s Trans=KB/s packin packout insize outsize Peak->Recv Trans
                  TYPERB/S Trans=KB/S packin packout insize outsize Peak->kecv Trans
348.8.0 1762.7.0 2415.4 3547.82 147.9 508.8 54165732.36641624.0
137.2.0 137.2.0 571.4 571.41 245.8 245.8 68349688.68349688.0
88.10 518.70 638.3 1024.9. 141.4 518.2 6327992.09159156.0
68.4.0 467.30 589.9 932.5. 118.7 513.2 16579126.9160192.0
84.8.0 310.70 510.0 659.8 170.3 482.2 15670342.9159391.0
107.5.0 466.00 677.3 930.5. 162.5 512.9 1558270.9162884.0
-/proc/diskstats mostly in KB/s Warning:contains duplicates
    bond0
       em2
       em4
Disk I/O -/proc/diskstats-
DiskName Busy Read WriteKB|0
sda
                                  0.01>
sdal
sda2
sda3
dm-0
                                 0.0|>
277.7|₩
dm-1
dm-2
Totals Read-MB/s=0.0
                                       Writes-MB/s=0.8
                                                                         Transfers/sec=40.5
```

### 3.2.1.3 查看数据节点的详细信息

数据节点一的详细信息

```
-Hostname=gpsdwl------Refresh= 2secs ---17:07.40-
Memory and Swap
                                                                    High-Memory Low-Memory - not in use - not in use
                                             Swap-space
                                                  16384.0
 Total in MB
                                                  16324.9
 Free in MB
 Free Percent
                                                     99.6%
Disk I/O /proc/diskstats mostly in KB/s Warning:contains duplicates-
DiskName Busy Read WriteKB|0 |25 |50 |75 100|
sda 15% 3276.2 6762.1 | RRRWWWW |
sda1 0% 0.0 0.0 |>
sda2 0% 0.0 0.0 |>
sda3 15% 3276.2 6762.1 | RRRWWWW |
sda3 15% 3276.2 6762.1 | RRRWWWW |
sda3 0% 0.0 0.0 |>
                                                                                                           100|
sda
sdal
sda2
sda3
              0% 0.0 0.01
0% 0.0 0.01
dm-0
dm-1
               15% 3276.2 6762.1 RRRWWWW
dm-2
Totals Read-MB/s=9.6
                                     Writes-MB/s=19/8
                                                                        Transfers/sec=1057.8
```

#### 数据节点二的详细信息

```
mon-16d-
                                                                                                                                                                -Hostname=gpsdw2-----Refresh= 2sec
   Memory and Swap
                                                                                                    RAM-Memory Swap-space
                                                                                                                                                                                                                                                                                                                                                   Low
                                                                                                                                                                   16384.0
      Total in MB
                                                                                                   386748.7
                                                                                                                   1718.1
  | 16.0% | 16383.1 | 100.0% | 16.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 10
    Free Percent
                                                                                                                                                                                       16383.1
 Disk I/O —/proc/diskstats mostly in KB/s Warning:contain
DiskName Busy Read WriteKE[0 sda 5% 319.6 6718.4 | RWW sda1 0% 0.0 0.0 | > sda2 0% 0.0 0.0 | >
                                                      5% 319.6 67<mark>18.4|RWW</mark>
 sda3
                                                       0% 0.0
0% 0.0
                                                                                                                               0.01
 dm-0
dm-2
 dm-1
                                                        5% 319.6 6718 4 RWW
                                                                                                                                          Writes MB/s=19.7
 Totals Read-MB/s=0.9
                                                                                                                                                                                                                                                                Transfers/sec=719
```

数据节点三的详细信息

### 3.2.2 验证数据的准确性

```
select count(*) from dim.test1;
```

-- 182683056

select pg\_size\_pretty(pg\_relation\_size('dim.test1'));

-- 27 GB

数据的准确性没问题

# 3.2.3 dblink 使用总结

dblink 因为中间需要映射一张临时表 dbltab,在以上的截图中可以看出, master 主节点的 cpu 比较高,数据节点还可以,可以用于比较小的表同步。

# 3.3 使用 gptransfer 同步数据

# 3.3.1 gptransfer 介绍

详细请查看官网介绍:

https://gpdb.docs.pivotal.io/510/utility\_guide/admin\_utilities/gptran\_sfer.html

#### 或查看中文文档:

https://gp-docs-cn.github.io/docs/admin\_guide/managing/gptransfer.htm

# 3.3.2 gptransfer 命令参数介绍

gptransfer 参数详细介绍请查看: https://blog.csdn.net/xfg0218/article/details/90233815

```
$ gptransfer --help
gptransfer
   { ---full |
   { [-d <database1> [ -d <database2> ... ]] |
   [-t \langle db. schema. table \rangle [ -t \langle db1. schema1. table 1 \rangle \ldots ]] |
   [-f <table-file> [--partition-transfer |
--partition-transfer-non-partition-target]]
   [-T \langle db. schema. table \rangle [ -T \langle db1. schema1. table 1 \rangle \ldots ]]
   [-F <table-file> ] }
   [--skip-existing | --truncate | --drop]
   [--analyze] [--validate=<type> ] [-x] [--dry-run]
   [--schema-only]
   [--no-final-count]
   [--source-host=\source host \ [--source-port=\source port \]
   [--source-user=<source user>] ]
   [--base-port=<base gpfdist port>]
   [--dest-host=\dest host\rangle --source-map-file=\host map file\rangle
   [--dest-port=<dest_port>] [--dest-user=<dest_user>] ]
   [--dest-database=<dest database name>]
   [--batch-size=<batch size>] [--sub-batch-size=<sub batch size>]
   [--timeout <seconds>]
   [--max-line-length=<length>]
   [--work-base-dir=\(\dir\)] [-1 \(\lambda\) [adir\)]
   [--delimiter=<delim>]
   [--format=[CSV|TEXT]]
   [--quote=(character)]
   [-v | --verbose]
   [-q \mid --quiet]
   [--gpfdist-verbose]
   [--gpfdist-very-verbose]
   \lceil -a \rceil
```

### 3.3.3 查看集群及硬件信息

硬件信息请查看:

查看表的大小

https://blog.csdn.net/xfg0218/article/details/82785196

select pg\_size\_pretty(pg\_relation\_size('dim.xiaoxu\_test1'));

### 3.3.4 同集群之间同步数据

### 3.3.4.1 查看表的详细信息

```
-- 27 GB
查看表的行数
select count(*) from dim. xiaoxu test1;
-- 182683056
3.3.4.2 进行表数据同步
查看 source_host_map_file 文件的配置
$ cat source_host_map_file
gpdev152,192.168.***.**
gpdev153,192.168.***.**
gpdev154,192.168.***.**
gpdev155,192.168.***.**
查看 source tb list 文件的配置,如果是多个表请一行一行的追加
$ cat source_tb_list
test.dim.test1
test:数据库的名字
dim:schema 的名字
test1:表的名字
$ gptransfer --source-host=192.168.***.** --source-port=5432 --source-user=gpadmin -f
source_tb_list
                --source-map-file=source_host_map_file -a --dest-host=192.168.***.**
```

20190515:15:21:04:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Starting gptransfer with args:

--dest-port=5432 --dest-database=stagging --drop

```
--source-host=192.168.***.** --source-port=5432 --source-user=gpadmin -t test.dim.test1 --source-map-file=source_host_map_file -a --dest-host=192.168.***.** --dest-port=5432 --dest-database=stagging --drop
```

20190515:15:21:04:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Validating options...

20190515:15:21:04:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Retrieving configuration of source Greenplum Database...

20190515:15:21:05:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Retrieving configuration of destination Greenplum Database...

20190515:15:21:06:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Retrieving source tables...

20190515:15:21:06:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Checking for gptransfer schemas...

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Retrieving list of destination tables...

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Reading source host map file...

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Building list of source tables to transfer...

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Number of tables to transfer:

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-gptransfer will use "fast" mode for transfer.

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Validating source host map...

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Validating transfer table set...

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Using batch size of 2

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Using sub-batch size of 24

20190515:15:21:07:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Creating work directory '/home/gpadmin/gptransfer 143245'

20190515:15:21:08:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Creating schema dim in database stagging...

20190515:15:21:09:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Starting transfer of test.dim.test1 to stagging.dim.test1...

20190515:15:21:09:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Creating target table stagging.dim.test1...

20190515:15:21:09:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Retrieving schema for table test.dim.test1...

20190515:15:21:12:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Transfering data test.dim.test1 -> stagging.dim.test1...

20190515:15:30:00:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Finished transferring table test.dim.test1, remaining 0 of 1 tables

20190515:15:30:00:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Running final table row count validation on destination tables...

20190515:15:30:09:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Validation of stagging.dim.test1 successful

20190515:15:30:09:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Removing work directories...

20190515:15:30:10:143245 gptransfer:gpdev152:gpadmin-[INFO]:-Finished.

在以上的日志可以看出执行的顺序是

- 1、先校验参数的正确性
- 2、检验数据源与目标源的数据库配置
- 3、校验源数据库中的表
- 4、检查 gptransfer 是否存在,如果存在回报 gptransfer schema already exists on the source system 警告,在源数据库的 schema 手动删除掉即可
- 5、检验源数据库集群映射文件
- 6、把原始文件加载到转换器
- 7、统计加载的数据源文件
- 8、在本地磁盘创建转换目录
- 9、在目标数据库中创建 schema
- 10、开启数据库员表到目标表的任务
- 11、创建目标表
- 12、开始到数据到目标表中
- 13、统计导到目标表的详细信息

任务是从 20190515:15:21:04 到 20190515:15:30:10 用时大概 9 分钟,大概 27G / 9m  $\approx$  3G/m 大约 51.2m/s,速度还可以

# 3.3.4.3 查看硬件详细信息

### 3.3.4.3.1 查看 master 节点的详细信息

查看 master 节点的网卡信息



查看 master 节点的 cpu 使用率



### 3.3.4.3.2 查看数据节点的详细信息

#### 查看数据节点一的网卡信息



### 查看数据节点一的 cpu 使用率



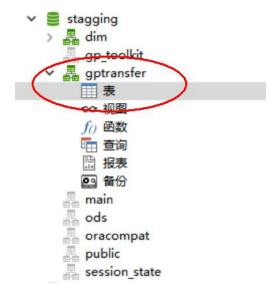
### 3.3.4.4 查看数据的准确性

查看表的大小

```
select pg_size_pretty(pg_relation_size('dim.xiaoxu_test1'));
-- 27 GB
查看表的行数
select count(*) from dim. xiaoxu test1;
-- 182683056
在以上可以看出数据都准确无误
3.3.4.5 使用 gptransfer 总结
在执行命令的服务器上执行 ps -ef|grep gptransfer 会看到以下日志信息,表示在机器上启动
gpfdist 服务,供外表查询数据提供服务
$ ps -ef | grep gptransfer
gpadmin 143245 98695 2 15:21 pts/1
                                        00:00:00 python
/usr/local/greenplum-db/./bin/gptransfer --source-host=192.168.***.** --source-port=5432
--source-user=gpadmin -t test.dim.test1 --source-map-file=source_host_map_file -a
--dest-host=192.168.***.** --dest-port=5432 --dest-database=stagging --drop
gpadmin 144007
                      1 13 15:21 ?
                                        00:00:01 gpfdist -d
/home/gpadmin/gptransfer_143245/test.dim.test1 -p 8000 -P 9000 -m 10485760 -t 300
gpadmin 144039
                      1 12 15:21 ?
                                        00:00:01 gpfdist -d
/home/gpadmin/gptransfer_143245/test.dim.test1 -p 8000 -P 9000 -m 10485760 -t 300
gpadmin 144048
                      1 13 15:21 ?
                                        00:00:01 gpfdist -d
/home/gpadmin/gptransfer_143245/test.dim.test1 -p 8000 -P 9000 -m 10485760 -t 300
gpadmin 144077
                      1 13 15:21 ?
                                        00:00:01 gpfdist -d
/home/gpadmin/gptransfer 143245/test.dim.test1 -p 8000 -P 9000 -m 10485760 -t 300
gpadmin 144079
                      1 13 15:21 ?
                                        00:00:01 gpfdist -d
/home/gpadmin/gptransfer 143245/test.dim.test1 -p 8000 -P 9000 -m 10485760 -t 300
gpadmin 144097
                      1 12 15:21 ?
                                        00:00:01 gpfdist -d
/home/gpadmin/gptransfer_143245/test.dim.test1 -p 8000 -P 9000 -m 10485760 -t 300
gpadmin 144118 143610 0 15:21?
                                        00:00:00 sh -c
GP_MASTER_HOST='192.168.***.**' && export GP_MASTER_HOST &&
GP MASTER PORT='5432' && export GP MASTER PORT &&
GP_SEG_PG_CONF='/data/gpsegment/p6/gpseg5/postgresql.conf' && export GP_SEG_PG_CONF
&& GP SEG DATADIR='/data/gpsegment/p6/gpseg5' && export GP SEG DATADIR &&
GP_DATABASE='test' && export GP_DATABASE && GP_USER='gpadmin' && export GP_USER &&
GP_DATE='20190515' && export GP_DATE && GP_TIME='152112' && export GP_TIME &&
GP_XID='1556272948-0002059298' && export GP_XID && GP_CID='2' && export GP_CID &&
GP_SN='0' && export GP_SN && GP_SEGMENT_ID='5' && export GP_SEGMENT_ID &&
```

GP\_SEG\_PORT='40005' && export GP\_SEG\_PORT && GP\_SESSION\_ID='30883' && export

在同步的 schema 的下会创建一个 gptransfer 的 schema,但不会存放数据



20190515:10:42:22:106113 gptransfer:gpdev152:gpadmin-[WARNING]:-The gptransfer schema already exists on the source system.

20190515:10:42:22:106113 gptransfer:gpdev152:gpadmin-[WARNING]:-This is likely due to a previous run on gptransfer

20190515:10:42:22:106113 gptransfer:gpdev152:gpadmin-[WARNING]:-being forcefully terminated and not properly cleaned up.

20190515:10:42:22:106113 gptransfer:gpdev152:gpadmin-[WARNING]:-Removing existing gptransfer schema on source system

# 3.3.5 不同集群之间同步数据

gptransfer --source-host=192.168.\*\*\*.\*\* --source-port=5432 --source-user=gpadmin -f source\_tb\_list --source-map-file=source\_host\_map\_file -a --dest-host=192.168.\*\*\*.\*\* --dest-port=5432 --dest-database=stagging --truncate

只需要修改: --source-host 与--source-map-file 即可在提示上输入目标 master 服务器的密码即可