Linux下挂载新硬盘

作者：朱君鹏 完成时间：2018年9月24日

在当前图工作站上，存在两块HDD盘，每块容量为1TB，但是没有被有效地利用。本文将详细说明如何在机器上挂载并使用新的HDD作为存储介质。这两块盘主要用于存储我们的测试数据。

磁盘分区

```
1 sudo fdisk -lu #查看磁盘及其所属分区的情况，得到如图1所示的结果，我们能够看到/dev/sdb和/dev/sdc没有正确的分区表
2 sudo fdisk /dev/sdb   #对/dev/sdb进行分区，输入该命令之后，首先按m打开帮助菜单，会看到如图2所示的情况；接着按n进行分区；接着需要需要patition number(分区数)，默认为1，也就是将/dev/sdb分成一个分区，在这里我们将要存储数据，因此设定为1，不做更为详细的分区，如图3；直接回车按照默认设置分区；成功分区之后会显示图4所示情况；接着在command中输入p显示最新的分区情况，如图5；最后在command中输入w保存/dev/sdb1分区
3 sudo fdisk -lu   #再次查看磁盘及其所属分区情况，看到/dev/sdb分区成功，如图7
4 sudo fdisk /dev/sdc   #对/dev/sdc进行分区，如图8所示
5
```

```
graph@graph-HP-Z8-G4-Workstation:~$ sudo fdisk -lu
Disk /dev/sda: 477 GiB, 512110190592 bytes, 1000215216 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 78BE5A0C-0EDC-45B8-A147-8A9006F25383

Device         Start        End   Sectors   Size Type
/dev/sda1       2048    1050623   1048576   512M EFI System
/dev/sda2    1050624   59643903  58593280    28G Linux filesystem
/dev/sda3   59643904   88266751  28622848  13.7G Linux swap
/dev/sda4   88266752 1000214527 911947776 434.9G Linux filesystem


Disk /dev/sdb: 931.5 GiB, 1000204886016 bytes, 1953525168 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 9F698017-A03B-4476-8A60-9DD0CBAE0613


Disk /dev/sdc: 931.5 GiB, 1000204886016 bytes, 1953525168 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: dos
Disk identifier: 0xa2c116d5
```

图1 查看磁盘及其所属分区情况

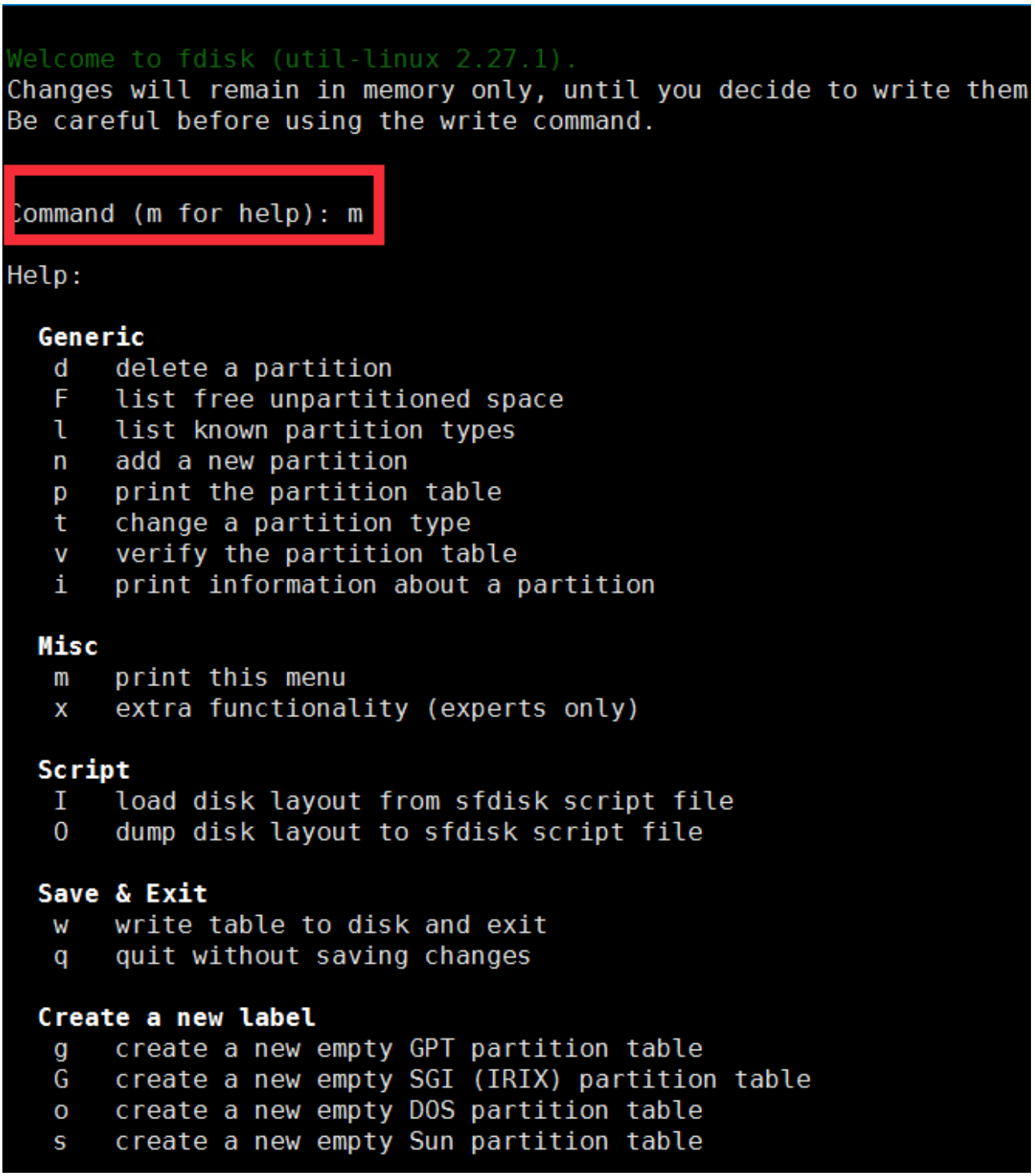
Welcome to fdisk (util-linux 2.27.1).
Changes will remain in memory only, until you decide to write them
Be careful before using the write command.
Command (m for help): m
Help:
Generic
d delete a partition
F list free unpartitioned space
l list known partition types
n add a new partition
p print the partition table
t change a partition type
v verify the partition table
i print information about a partition
Misc
m print this menu
x extra functionality (experts only)
Script
I load disk layout from sfdisk script file
O dump disk layout to sfdisk script file
Save & Exit
w write table to disk and exit
q quit without saving changes
Create a new label
g create a new empty GPT partition table
G create a new empty SGI (IRIX) partition table
o create a new empty DOS partition table
s create a new empty Sun partition table

图2 按m显示帮助命令

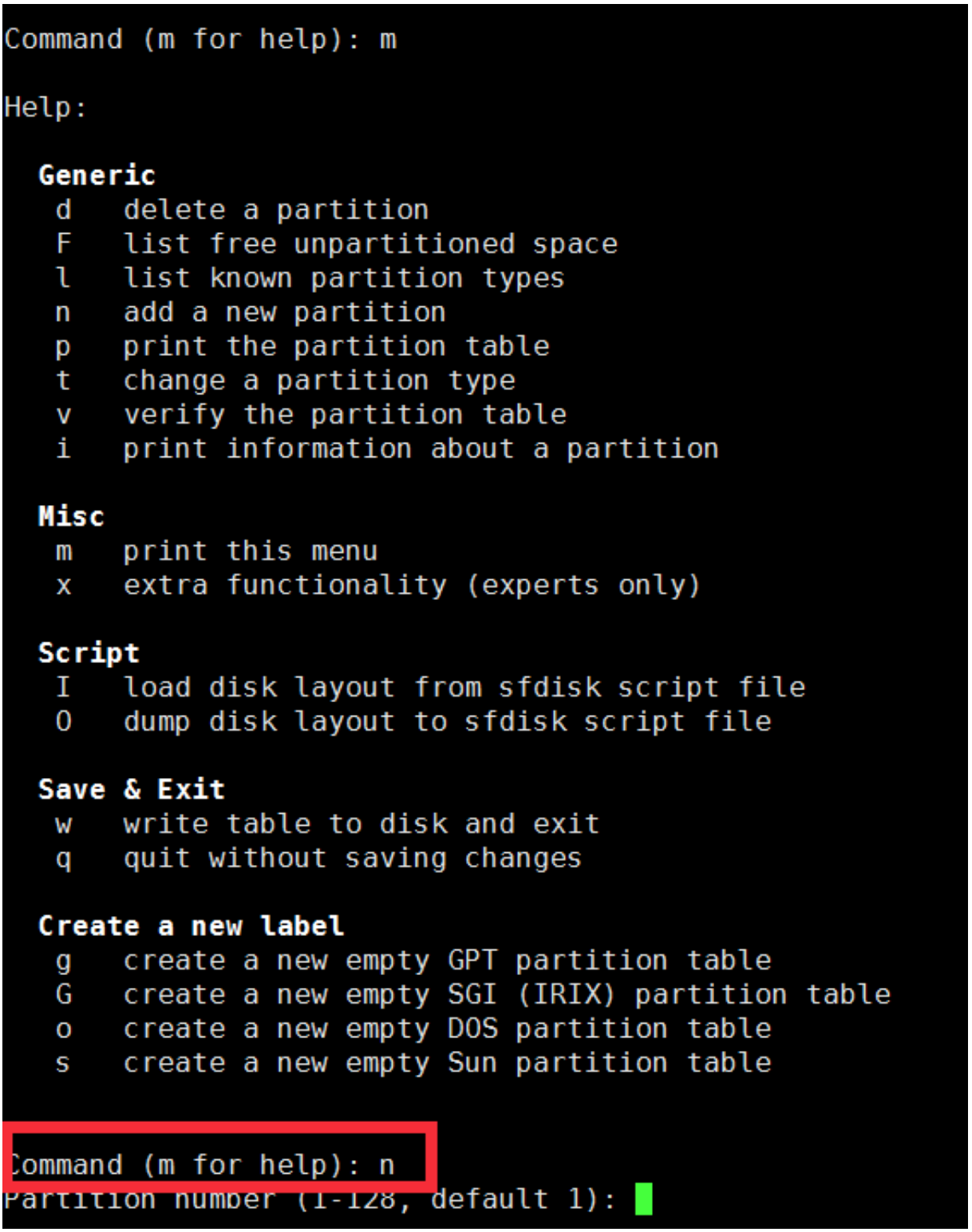
Command (m for help): m
Help:
Generic
d delete a partition
F list free unpartitioned space
l list known partition types
n add a new partition
p print the partition table
t change a partition type
v verify the partition table
i print information about a partition
Misc
m print this menu
x extra functionality (experts only)
Script
I load disk layout from sfdisk script file
O dump disk layout to sfdisk script file
Save & Exit
w write table to disk and exit
q quit without saving changes
Create a new label
g create a new empty GPT partition table
G create a new empty SGI (IRIX) partition table
o create a new empty DOS partition table
s create a new empty Sun partition table
Command (m for help): n
Partition number (1-128, default 1):

图3 按n增加一个分区

```
Help:

  Generic
   d   delete a partition
   F   list free unpartitioned space
   l   list known partition types
   n   add a new partition
   p   print the partition table
   t   change a partition type
   v   verify the partition table
   i   print information about a partition

  Misc
   m   print this menu
   x   extra functionality (experts only)

  Script
   I   load disk layout from sfdisk script file
   O   dump disk layout to sfdisk script file

  Save & Exit
   w   write table to disk and exit
   q   quit without saving changes

  Create a new label
   g   create a new empty GPT partition table
   G   create a new empty SGI (IRIX) partition table
   o   create a new empty DOS partition table
   s   create a new empty Sun partition table

Command (m for help): n
Partition number (1-128, default 1): 1
First sector (34-1953525134, default 2048):
Last sector, +sectors or +size{K,M,G,T,P} (2048-1953525134, default 1953525134):

Created a new partition 1 of type 'Linux filesystem' and of size 931.5 GiB.

Command (m for help):
```

图4 成功完成/dev/sdb的分区工作

```
Command (m for help): p
Disk /dev/sdb: 931.5 GiB, 1000204886016 bytes, 1953525168 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 9F698017-A03B-4476-8A60-9DD0CBAE0613

Device     Start        End    Sectors   Size Type
/dev/sdb1   2048 1953525134 1953523087 931.5G Linux filesystem

Command (m for help):
```

图5 按p显示新增分区

```
Device     Start        End    Sectors   Size Type
/dev/sdb1   2048 1953525134 1953523087 931.5G Linux filesystem

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

图6 按w保存/dev/sdb1分区

```
graph@graph-HP-Z8-G4-Workstation:~$ sudo fdisk -lu
Disk /dev/sda: 477 GiB, 512110190592 bytes, 1000215216 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 78BE5A0C-0EDC-45B8-A147-8A9006F25383

Device        Start        End   Sectors   Size Type
/dev/sda1      2048    1050623   1048576   512M EFI System
/dev/sda2   1050624   59643903  58593280    28G Linux filesystem
/dev/sda3  59643904   88266751  28622848  13.7G Linux swap
/dev/sda4  88266752 1000214527 911947776 434.9G Linux filesystem


Disk /dev/sdb: 931.5 GiB, 1000204886016 bytes, 1953525168 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 9F698017-A03B-4476-8A60-9DD0CBAE0613

Device     Start        End    Sectors   Size Type
/dev/sdb1   2048 1953525134 1953523087 931.5G Linux filesystem


Disk /dev/sdc: 931.5 GiB, 1000204886016 bytes, 1953525168 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: dos
Disk identifier: 0xa2c116d5
```

图7 /dev/sdb分区成功

```
graph@graph-HP-Z8-G4-Workstation:~$ sudo fdisk -lu
Disk /dev/sda: 477 GiB, 512110190592 bytes, 1000215216 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 78BE5A0C-0EDC-45B8-A147-8A9006F25383

Device        Start        End   Sectors   Size Type
/dev/sda1      2048    1050623   1048576   512M EFI System
/dev/sda2   1050624   59643903  58593280    28G Linux filesystem
/dev/sda3  59643904   88266751  28622848  13.7G Linux swap
/dev/sda4  88266752 1000214527 911947776 434.9G Linux filesystem


Disk /dev/sdb: 931.5 GiB, 1000204886016 bytes, 1953525168 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 9F698017-A03B-4476-8A60-9DD0CBAE0613

Device     Start        End    Sectors   Size Type
/dev/sdb1   2048 1953525134 1953523087 931.5G Linux filesystem


Disk /dev/sdc: 931.5 GiB, 1000204886016 bytes, 1953525168 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: dos
Disk identifier: 0xa2c116d5

Device     Boot Start        End    Sectors   Size Id Type
/dev/sdc1        2048 1953525167 1953523120 931.5G  5 Extended
```

图8 分别对/dev/sdb和/dev/sdc成功分区

磁盘格式化

```
1 sudo mkfs -t ext4 /dev/sdb   #-t ext4 表示将分区格式化成ext4文件系统类型，如图9所示，输入该命令之后，会让你确认Proceed anyway? (y,n)按y确认，之后需要等待一段时间
2 sudo mkfs -t ext4 /dev/sdc   #如图10
```

```
graph@graph-HP-Z8-G4-Workstation:~$ sudo mkfs -t ext4 /dev/sdb
mke2fs 1.42.13 (17-May-2015)
Found a gpt partition table in /dev/sdb
Proceed anyway? (y,n) y
Creating filesystem with 244190646 4k blocks and 61054976 inodes
Filesystem UUID: 0ab199f6-ec0e-4599-8b2a-c04f7d3cadcb
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000, 7962624, 11239424, 20480000, 23887872, 71663616, 78675968,
        102400000, 214990848

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

图9 成功将/dev/sdb格式化为ext4文件系统类型

```
graph@graph-HP-Z8-G4-Workstation:~$ sudo mkfs -t ext4 /dev/sdc
mke2fs 1.42.13 (17-May-2015)
Found a dos partition table in /dev/sdc
Proceed anyway? (y,n) y
Creating filesystem with 244190646 4k blocks and 61054976 inodes
Filesystem UUID: 3d2ddd25-955f-45d5-ba97-0741ecf88730
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000, 7962624, 11239424, 20480000, 23887872, 71663616, 78675968,
        102400000, 214990848

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

图10 成功将/dev/sdc格式化为ext4文件系统类型

挂载硬盘分区

```
sudo df -l  #显示硬盘挂载情况，新硬盘分区没有挂载，因此不能查到相关的挂载信息
mkdir /devdata1
mkdir /devdata2
sudo mount -t ext4 /dev/sdb /devdata1  #指定硬盘分区文件系统类型为 ext4 ，同时将 /dev/sdb 分区挂载到目录 /devdata1
sudo mount -t ext4 /dev/sdc /devdata2  #指定硬盘分区文件系统类型为 ext4 ，同时将/dev/sdc分区挂载到目录 /devdata2
```

```
graph@graph-HP-Z8-G4-Workstation:~$ df -l
Filesystem     1K-blocks     Used Available Use% Mounted on
udev           263491068        0 263491068   0% /dev
tmpfs           52704996    10392  52694604   1% /run
/dev/sda2       28705788 11860608  15363964  44% /
tmpfs          263524976     8744 263516232   1% /dev/shm
tmpfs               5120        4      5116   1% /run/lock
tmpfs          263524976        0 263524976   0% /sys/fs/cgroup
/dev/sda1         523248     3496    519752   1% /boot/efi
/dev/sda4      448687904 37101544 388771284   9% /home
tmpfs           52704996       56  52704940   1% /run/user/1000
/dev/sdb       961303584    73364 912375708   1% /devdata1
/dev/sdc       961303584    73364 912375708   1% /devdata2
graph@graph-HP-Z8-G4-Workstation:~$
```

图11 新挂载的硬盘

按照上述命令成功挂载磁盘，关机之后，磁盘会被自动卸载，因此，最后我们还需要执行一步十分关键的操作，编辑/etc/fstab文件，配置磁盘的开机自动挂载操作。

配置开机自动挂载硬盘操作

```
sudo vim /etc/fstab #编辑该文件，文件格式如图12所示
sudo mount -a   #检查是否上述编辑参数有误，如果无误，不会回写任何信息
df -h  #查看是否挂载成功，如图13所示
sudo reboot  #重启计算机
df -h   #再次查看开机自动挂载是否成功
```

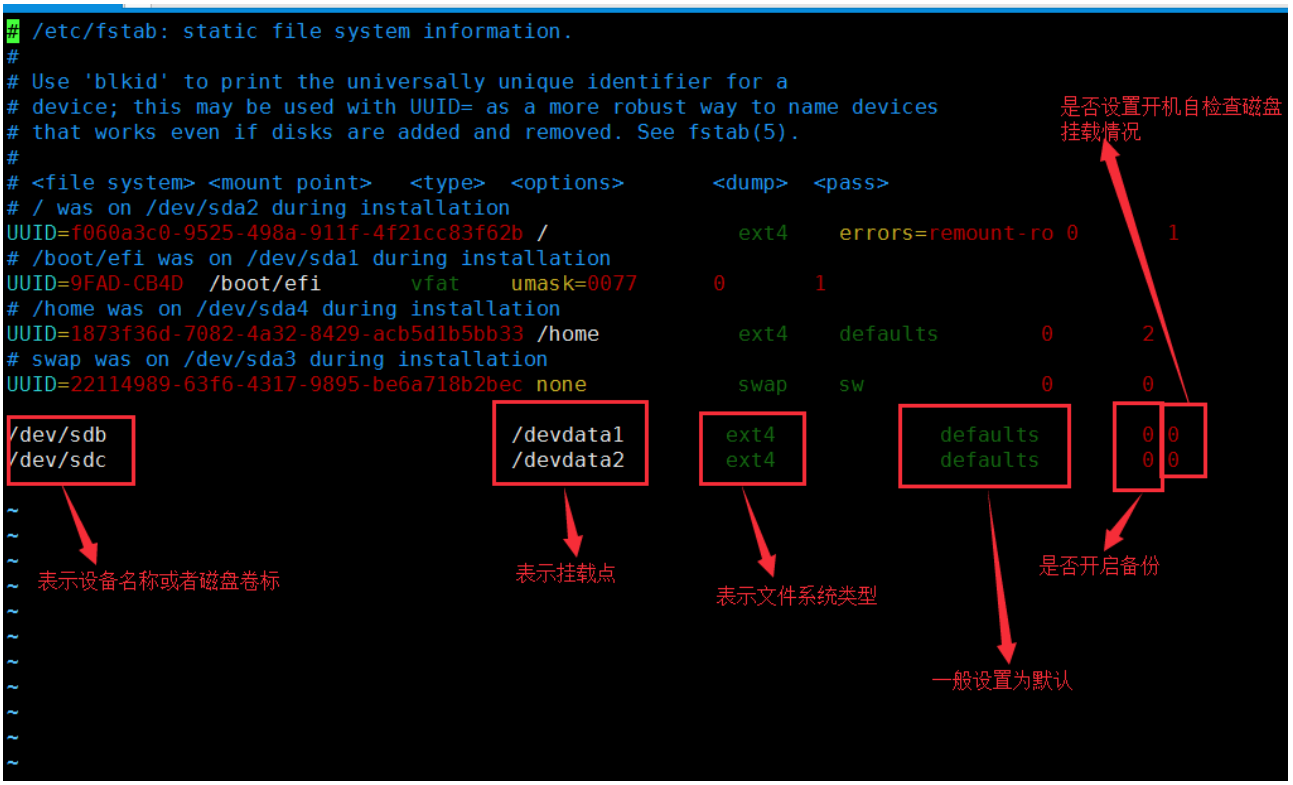

图12 /etc/fstab中参数的含义

```
graph@graph-HP-Z8-G4-Workstation:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            252G     0  252G   0% /dev
tmpfs            51G   11M   51G   1% /run
/dev/sda2        28G   12G   15G  44% /
tmpfs           252G  8.6M  252G   1% /dev/shm
tmpfs           5.0M  4.0K  5.0M   1% /run/lock
tmpfs           252G     0  252G   0% /sys/fs/cgroup
/dev/sda1       511M  3.5M  508M   1% /boot/efi
/dev/sda4       428G   36G  371G   9% /home
tmpfs            51G   56K   51G   1% /run/user/1000
/dev/sdb        917G   72M  871G   1% /devdata1
/dev/sdc        917G   72M  871G   1% /devdata2
graph@graph-HP-Z8-G4-Workstation:~$
```

图13 使用df -h命令查看挂载情况