

Linux 基础入门之实验七文件系统操作与磁盘管理

本次实验主要学习 df、du、mount 命令的使用和磁盘相关知识。

1. 基本操作

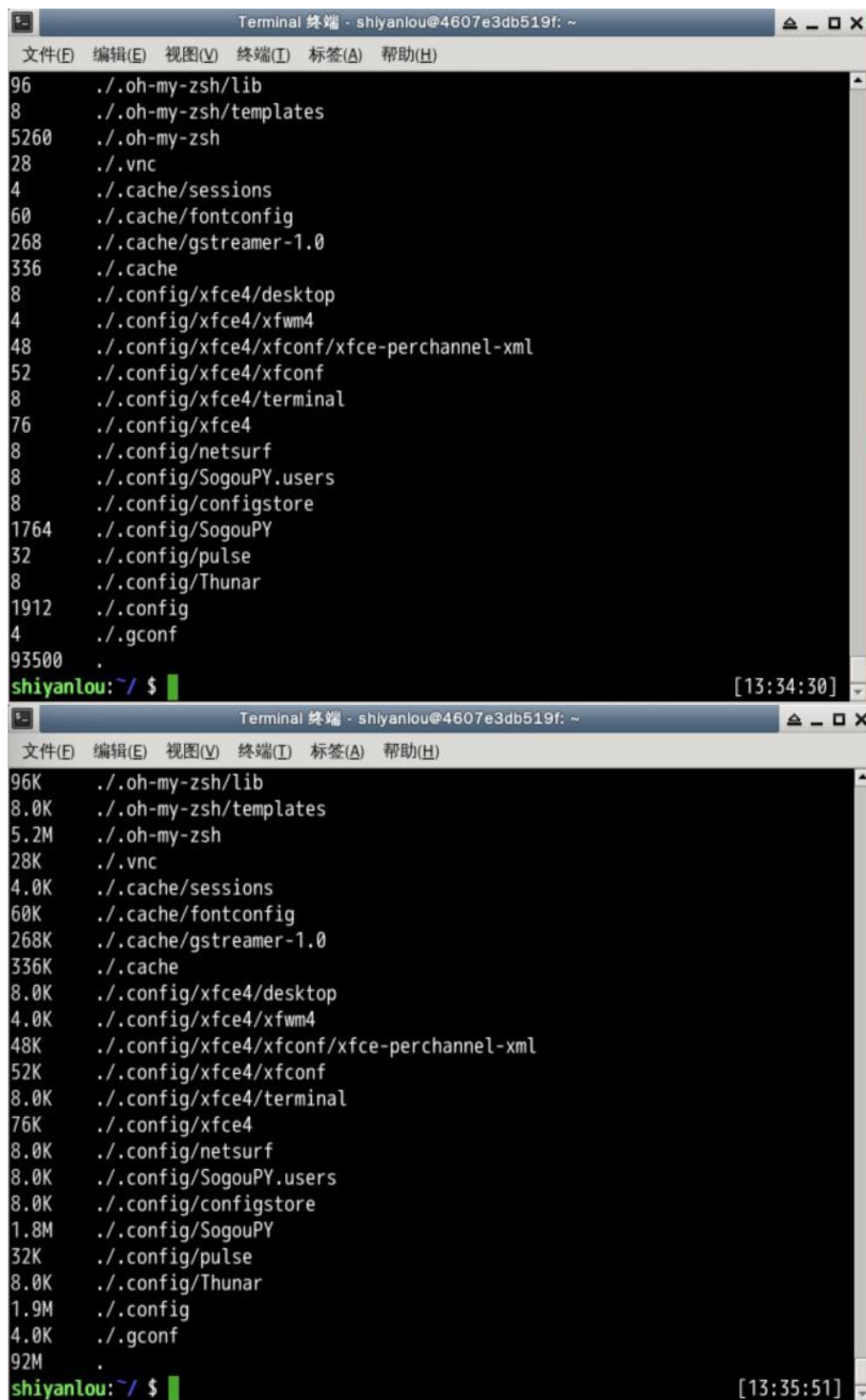
(1) df 命令查看磁盘容量

```
Terminal 终端 - shiyanlou@4607e3db519f: ~
文件(F) 编辑(E) 视图(V) 终端(T) 标签(A) 帮助(H)

shiyanlou:~/ $ df [13:09:39]
文件系统
      1K-块    已用    可用 已用% 挂载点
/dev/mapper/docker-253:17-15204353-5e9651089fda6a9163f42b32cc99f6dfd0f1a8404d3a0
2e03dd7f2006fa8c3e0 12254384  6749592  4859264   59% /
tmpfs
      65536         0   65536    0% /dev
tmpfs
      4087540         0  4087540    0% /sys/fs/cgroup
/dev/vdb1
      309505024 207160828 86599224   71% /etc/hosts
shm
      65536         84   65452    1% /dev/shm
tmpfs
      4087540         0  4087540    0% /proc/acpi
tmpfs
      4087540         0  4087540    0% /proc/scsi
tmpfs
      4087540         0  4087540    0% /sys/firmware
shiyanlou:~/ $ [13:09:41]

shiyanlou:~/ $ df -h [13:09:41]
文件系统
      容量  已用  可用 已用% 挂载点
/dev/mapper/docker-253:17-15204353-5e9651089fda6a9163f42b32cc99f6dfd0f1a8404d3a0
2e03dd7f2006fa8c3e0  12G  6.5G  4.7G   59% /
tmpfs
      64M    0   64M    0% /dev
tmpfs
      3.9G    0   3.9G    0% /sys/fs/cgroup
/dev/vdb1
      296G 198G   83G   71% /etc/hosts
shm
      64M  84K   64M    1% /dev/shm
tmpfs
      3.9G    0   3.9G    0% /proc/acpi
tmpfs
      3.9G    0   3.9G    0% /proc/scsi
tmpfs
      3.9G    0   3.9G    0% /sys/firmware
shiyanlou:~/ $ [13:18:27]
```

(2) du 命令查看目录的容量



The image displays two terminal windows from a Linux system, showing the results of a directory size analysis. The top window shows the initial state with various directories and their sizes in bytes. The bottom window shows the same list after cleanup, with sizes in human-readable format (K, M).

Terminal 1 (Initial State):

```
Terminal 终端 - shiyanlou@4607e3db519f: ~
文件(E) 编辑(E) 视图(V) 终端(T) 标签(A) 帮助(H)
96      ./oh-my-zsh/lib
8        ./oh-my-zsh/templates
5260     ./oh-my-zsh
28       ./vnc
4        ./cache/sessions
60       ./cache/fontconfig
268      ./cache/gstreamer-1.0
336      ./cache
8        ./config/xfce4/desktop
4        ./config/xfce4/xfwm4
48       ./config/xfce4/xfconf/xfce-perchannel-xml
52       ./config/xfce4/xfconf
8        ./config/xfce4/terminal
76       ./config/xfce4
8        ./config/netsurf
8        ./config/SogouPY.users
8        ./config/configstore
1764     ./config/SogouPY
32       ./config/pulse
8        ./config/Thunar
1912     ./config
4        ./gconf
93500    .
shiyanlou:~/ $ [13:34:30]
```

Terminal 2 (After Cleanup):

```
Terminal 终端 - shiyanlou@4607e3db519f: ~
文件(E) 编辑(E) 视图(V) 终端(T) 标签(A) 帮助(H)
96K      ./oh-my-zsh/lib
8.0K     ./oh-my-zsh/templates
5.2M     ./oh-my-zsh
28K      ./vnc
4.0K     ./cache/sessions
60K      ./cache/fontconfig
268K     ./cache/gstreamer-1.0
336K     ./cache
8.0K     ./config/xfce4/desktop
4.0K     ./config/xfce4/xfwm4
48K      ./config/xfce4/xfconf/xfce-perchannel-xml
52K      ./config/xfce4/xfconf
8.0K     ./config/xfce4/terminal
76K      ./config/xfce4
8.0K     ./config/netsurf
8.0K     ./config/SogouPY.users
8.0K     ./config/configstore
1.8M     ./config/SogouPY
32K      ./config/pulse
8.0K     ./config/Thunar
1.9M     ./config
4.0K     ./gconf
92M      .
shiyanlou:~/ $ [13:35:51]
```

2.简单的磁盘管理

(1) dd 命令从标准输入读入用户的输入到标准输出

```

shiyanolou:~/ $ dd of=test bs=10 count=1 [13:35:51]
hello shiyanolou
记录了1+0 的读入
记录了1+0 的写出
10 bytes copied, 11.5125 s, 0.0 kB/s
shiyanolou:~/ $ anlou [13:38:36]
zsh: command not found: anlou
shiyanolou:~/ $ anlou [13:38:36]
zsh: command not found: anlou
shiyanolou:~/ $ du -b test [13:38:58]
10      test
shiyanolou:~/ $ cat test [13:39:10]
hello shiy
shiyanolou:~/ $ [13:39:23]

```

(2)dd 命令创建虚拟镜像文件

```

shiyanolou:~/ $ dd if=/dev/zero of=virtual.img bs=1M count=256 [13:44:32]
记录了256+0 的读入
记录了256+0 的写出
268435456 bytes (268 MB, 256 MiB) copied, 0.617041 s, 435 MB/s
shiyanolou:~/ $ du -h virtual.img [13:46:56]
257M    virtual.img
shiyanolou:~/ $ [13:47:15]

```

(3)mkfs 命令格式化磁盘

```

shiyanolou:~/ $ sudo mkfs.ext4 virtual.img [13:49:53]
mke2fs 1.42.13 (17-May-2015)
Discarding device blocks: 完成
Creating filesystem with 262144 1k blocks and 65536 inodes
Filesystem UUID: e92cb64a-b1cf-4532-8bbe-893a622efee1
Superblock backups stored on blocks:
    8193, 24577, 40961, 57345, 73729, 204801, 221185

Allocating group tables: 完成
正在写入inode表: 完成
Creating journal (8192 blocks): 完成
Writing superblocks and filesystem accounting information: 完成

shiyanolou:~/ $ [13:50:15]

```

(4)mount 命令挂载磁盘到目录树,unmount 命令卸载已挂载磁盘

```

shiyanolou:~/ $ mount -o loop -t ext4 virtual.img /mnt [13:53:13]
mount: only root can use "--options" option
shiyanolou:~/ $ [13:53:55]

```

(5)fdisk 命令为磁盘分区

```

$ sudo fdisk -l
$ sudo fdisk virtual.img
$ sudo losetup /dev/loop0 virtual.img
$ sudo losetup -d /dev/loop0
$ sudo kpartx -dv /dev/loop0
$ sudo mkfs.ext4 -q /dev/mapper/loop0p1
$ mkdir -p /media/virtualdisk_1
$ df -h

```

2.作业

```
shiyantou:~/ $ du -a | sort -n -r | head -n 10 [13:53:55]
102096 .
84592 ./nvm
70840 ./nvm/versions
70836 ./nvm/versions/node
70832 ./nvm/versions/node/v8.11.1
34032 ./nvm/versions/node/v8.11.1/bin
34028 ./nvm/versions/node/v8.11.1/bin/node
33576 ./nvm/versions/node/v8.11.1/lib
33572 ./nvm/versions/node/v8.11.1/lib/node_modules
33568 ./nvm/versions/node/v8.11.1/lib/node_modules/npm
shiyantou:~/ $ [14:05:04]
```