



# 南昌大学实验报告

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实验类型：☒ 验证 ☐ 综合 ☐ 设计 ☐ 创新 实验日期：\_\_\_\_2021.11.10\_\_\_\_ 实验成绩：\_\_\_\_

## 一、 实验项目名称

Linux 系统管理

## 二、 实验目的

1. 了解 Linux 系统服务进程的概念。
2. 熟悉 Linux 磁盘操作管理的相关内容。
3. 掌握进程管理的操作。

## 三、 实验要求

要求使用 Xshell 进行登录，具体操作如下：

1. 任意使用多个命令后，利用 ps 显示所有用户进程的详细信息，并说明这些进程的当前状态。

```
root 1673 0.0 0.0 155472 1856 pts/0 R+ 15:37 0:00 ps -aux

[1]+ 已停止 vi
[root@localhost mnt]# clear
[root@localhost mnt]# vi &
[2] 1676
[root@localhost mnt]# ls &
[3] 1677

[2]+ 已停止 vi
[root@localhost mnt]# cdrom
cd &
[4] 1678
[3] 完成 ls --color=auto
[root@localhost mnt]# ps -aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.0  0.1 193548 6712 ?        Ss   14:43   0:02 /usr/lib/systemd/systemd --switched
root         2  0.0  0.0      0     0 ?        S    14:43   0:00 [kthreadd]
root         4  0.0  0.0      0     0 ?        S<   14:43   0:00 [kworker/0:0H]
root         5  0.0  0.0      0     0 ?        S    14:43   0:00 [kworker/u256:0]
root         6  0.0  0.0      0     0 ?        S    14:43   0:00 [ksoftirqd/0]
root         7  0.0  0.0      0     0 ?        S    14:43   0:00 [migration/0]
root         8  0.0  0.0      0     0 ?        S    14:43   0:00 [rcu_bh]
root         9  0.0  0.0      0     0 ?        S    14:43   0:00 [rcu_sched]
root        10  0.0  0.0      0     0 ?        S<   14:43   0:00 [lru-add-drain]

root 1672 0.0 0.0 124176 1592 pts/0 T    15:36   0:00 vi
root 1674 0.0 0.0      0     0 ?        S    15:39 0:00 [kworker/0:0]
root 1676 0.0 0.0 124176 1592 pts/0 T    15:39   0:00 vi
root 1679 0.0 0.0 155472 1864 pts/0 R+   15:39   0:00 ps -aux
```

T 表示 vi 进程现在处于停止状态，S 表示休眠，R+表示 ps -aux 正在进行且位于后台。

2. 以自己姓名全拼的用户以终端方式，root 用户使用 Xshell 远程登录，使用 top 命令只显示以自己姓名全拼登录的用户进程信息，并删除该进程，结果如何？

```
top - 15:45:44 up 1:01, 2 users, load average: 0.00, 0.01, 0.05
Tasks: 120 total, 1 running, 117 sleeping, 2 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.1 sy, 0.0 ni, 99.9 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 3861300 total, 3504372 free, 202748 used, 154180 buff/cache
KiB Swap: 524284 total, 524284 free, 0 used. 3455416 avail Mem
Which user (blank for all) dingjun
  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
 1688 dingjun    20   0 115676   2280  1624 S   0.0   0.1   0:00.01  bash
```

```
[root@localhost mnt]# kill -9 1688
[root@localhost mnt]#
```

```
CentOS Linux 7 (Core)
Kernel 3.10.0-1127.el7.x86_64 on an x86_64

Hint: Num Lock on

localhost login: _
```

3. 延迟 5 秒后显示内存使用情况。

```
[root@localhost mnt]# sleep 5;free
              total        used        free      shared  buff/cache   available
Mem:           3861300      201508      3505556        11836        154236      3456628
Swap:           524284           0           524284
```

4. 自己设计一组案例，对进程的前台和后台进行控制。

```
完毕! 8003119100丁俊
[root@localhost ~]# nc -lp 8000 &
[1] 1987
[root@localhost ~]# jobs -l
[1]+  1987 运行中                  nc -lp 8000 &
[root@localhost ~]# fg 1
nc -lp 8000
^Z
[1]+  已停止                  nc -lp 8000
[root@localhost ~]# jobs -l
[1]+  1987 停止                  nc -lp 8000
[root@localhost ~]# bg1
-bash: bg1: 未找到命令
[root@localhost ~]# bg 1
[1]+ nc -lp 8000 &
[root@localhost ~]# jobs -l
[1]+  1987 运行中                  nc -lp 8000 &
[root@localhost ~]#
```

5. 任意选择一个服务，查看是否开机启动，如没有开机启动，请设置为开机自启。

```
bus-org.freedesktop.import1.service      static
bus-org.freedesktop.locale1.service      static
bus-org.freedesktop.login1.service        static
bus-org.freedesktop.machine1.service     static
bus-org.freedesktop.nm-dispatcher.service enabled
bus-org.freedesktop.timedate1.service     static
bus.service                              static
root@localhost mnt]# systemctl list-unit-files --type service | grep console-shell
console-shell.service                    disabled
root@localhost mnt]# systemctl enable console-shell.service
Created symlink from /etc/systemd/system/getty.target.wants/console-shell.service to /usr/lib/systemd/system/console-shell.service.
root@localhost mnt]# systemctl list-unit-files --type service | grep console-shell
console-shell.service                    enabled
root@localhost mnt]#
```

6. 任意选择一个服务，查看该服务的状态，如果启动请停止，反之亦然。

```
****@192.168.2.136:22
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[root@localhost mnt]# service crond status
Redirecting to /bin/systemctl status crond.service
• crond.service - Command Scheduler
  Loaded: loaded (/usr/lib/systemd/system/crond.service; enabled; vendor preset: enabled)
  Active: active (running) since 三 2021-11-10 14:43:56 CST; 1h 14min ago
  Main PID: 585 (crond)
  CGroup: /system.slice/crond.service
          └─585 /usr/sbin/crond -n

11月 10 14:43:56 localhost.localdomain systemd[1]: Started Command Scheduler.
11月 10 14:43:56 localhost.localdomain crond[585]: (CRON) INFO (RANDOM_DELAY will be scaled with fac
11月 10 14:43:57 localhost.localdomain crond[585]: (CRON) INFO (running with inotify support)
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost mnt]# service crond stop
Redirecting to /bin/systemctl stop crond.service
[root@localhost mnt]# service crond status
Redirecting to /bin/systemctl status crond.service
• crond.service - Command Scheduler
  Loaded: loaded (/usr/lib/systemd/system/crond.service; enabled; vendor preset: enabled)
  Active: inactive (dead) since 三 2021-11-10 15:58:23 CST; 4s ago
  Process: 585 ExecStart=/usr/sbin/crond -n $CRONDARGS (code=exited, status=0/SUCCESS)
  Main PID: 585 (code=exited, status=0/SUCCESS)

11月 10 14:43:56 localhost.localdomain systemd[1]: Started Command Scheduler.
11月 10 14:43:56 localhost.localdomain crond[585]: (CRON) INFO (RANDOM_DELAY will be scaled with fac
```

7. 设置 centos 系统镜像为系统启动时自动挂载，利用转换服务运行级别的方式进行重启，以验证挂载成功。Vi /etc/fstab

```
[root@localhost ~]# mount /dev/cdrom /mnt/cdrom
mount: /dev/sr0 写保护，将以只读方式挂载
[root@localhost ~]# mount -o loop /dev/cdrom /mnt/cdrom
[root@localhost ~]# vi /etc/fstab
[root@localhost ~]#
```

```
#
# /etc/fstab
# Created by anaconda on Tue Nov 2 20:03:03 2021
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
UUID=2bc48cfb-675e-41ba-b5b3-cbcef3dde127 / xfs defaults 0 0
UUID=3c271069-4ddb-435a-acd3-fb0a5201d28a /boot xfs defaults 0 0
UUID=f33745da-2740-47d5-95fb-cc7be0e392b8 swap swap defaults 0 0
/dev/cdrom /mnt/cdrom iso9660 defaults 0 0
~
~
~
```



```
192.168.2.136:22
您去左侧的箭头按钮。
1 CentOS7
[root@localhost ~]# mount /dev/sr0 /mnt/cdrom
mount: /dev/sr0 写保护, 将以只读方式挂载
mount: /dev/sr0 已经挂载或 /mnt/cdrom 忙
/dev/sr0 已经挂载到 /mnt/cdrom 上
[root@localhost ~]# vi /etc/fstab
[root@localhost ~]# mount -a
[root@localhost ~]# cd /mnt/cdrom
[root@localhost cdrom]# ls
CentOS_BuildTag  EULA  images  LiveOS  repodata  RPM-GPG-KEY-CentOS-Testing-7
EFI             GPL  isolinux Packages RPM-GPG-KEY-CentOS-7  TRANS.TBL
[root@localhost cdrom]#
```

```
[root@localhost cdrom]# ls
CentOS_BuildTag  EULA  images  LiveOS  repodata
EFI             GPL  isolinux Packages RPM-GPG-KEY-Ce
[root@localhost cdrom]# cd ~
[root@localhost ~]# init 6
Connection closing...Socket close.

Connection closed by foreign host.

Disconnected from remote host(centOs7) at 16:04:20.

Type `help' to learn how to use Xshell prompt.
[C:\~]$
```

```
CentOS7
192.168.2.136
22
SSH
root

CentOS 7 64 位
重启
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CentOS Linux (3.10.0-1127.el7.x86_64) 7 (Core)
CentOS Linux (0-rescue-b05c73360bf94a7e0677c9b0849b5c703) 7 (Core)

Use the ↑ and ↓ keys to change the selection.
Press 'e' to edit the selected item, or 'c' for a command prompt.
The selected entry will be started automatically in 3s.
```

## 自动挂载成功

```
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CentOS Linux 7 (Core)
Kernel 3.10.0-1127.el7.x86_64 on an x86_64

localhost login: root
Password:
Login incorrect

localhost login: root
Password:
Last failed login: Fri Nov 12 15:14:24 CST 2021 on tty1
There was 1 failed login attempt since the last successful login.
Last login: Wed Nov 10 16:11:03 from 192.168.2.1
[root@localhost ~]# ls /mnt
cdrom
[root@localhost ~]# ls cdrom
ls: cannot access cdrom: No such file or directory
[root@localhost ~]# cd cdrom
bash: cd: cdrom: No such file or directory
[root@localhost ~]# cd /mnt/cdrom
[root@localhost cdrom]# ls
CentOS_BuildTag  EULA  images  LiveOS  repodata  RPM-GPG-KEY-CentOS-7  RPM-GPG-KEY-CentOS-Testing-7  TRANS.TBL
EFI  GPL  isolinux  Packages  RPM-GPG-KEY-CentOS-7  TRANS.TBL
[root@localhost cdrom]#
```

## 8. 查看自动挂载的光盘设备的分区信息和磁盘空间统计信息。

```
***@192.168.2.136:22
点击左侧的箭头按钮。

1 centos7
[root@localhost ~]# fdisk -l

磁盘 /dev/sda: 21.5 GB, 21474836480 字节, 41943040 个扇区
Units = 扇区 of 1 * 512 = 512 bytes
扇区大小(逻辑/物理): 512 字节 / 512 字节
I/O 大小(最小/最佳): 512 字节 / 512 字节
磁盘标签类型: dos
磁盘标识符: 0x000a43aa

    设备 Boot      Start         End      Blocks   Id  System
/dev/sda1  *           2048        616447       307200   83   Linux
/dev/sda2                616448       1665023       524288   82   Linux swap / Solaris
/dev/sda3          1665024       41943039      20139008   83   Linux

磁盘 /dev/loop0: 10.3 GB, 10273947648 字节, 20066304 个扇区
Units = 扇区 of 1 * 512 = 512 bytes
扇区大小(逻辑/物理): 512 字节 / 512 字节
I/O 大小(最小/最佳): 512 字节 / 512 字节
磁盘标签类型: dos
磁盘标识符: 0x6b8b4567

    设备 Boot      Start         End      Blocks   Id  System
/dev/loop0p1  *              0       20066303      10033152    0  Empty
/dev/loop0p2          5720         23127          8704    ef  EFI (FAT-12/16/32)
[root@localhost ~]#
```

```
[root@localhost cdrom]# du -sh
9.6G  .
[root@localhost cdrom]# du -sh *
512   CentOS_BuildTag
8.3M  EFI
512   EULA
18K   GPL
68M   images
60M   isolinux
491M  LiveOS
9.0G  Packages
29M   repodata
2.0K  RPM-GPG-KEY-CentOS-7
2.0K  RPM-GPG-KEY-CentOS-Testing-7
3.0K  TRANS.TBL
[root@localhost cdrom]#
```

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#### 四、主要仪器设备及耗材

计算机、VMware、CentOS 7、word

#### 五、实验步骤

#### 六、实验数据及处理结果

#### 七、思考讨论题或体会或对改进实验的建议

#### 八、参考资料

[1] 文东戈,赵艳芹.Linux 操作系统实用教程（第 2 版）[M].北京：清华大学出版社.2019,9.