

Анализ файловой структуры UNIX. Команды для работы с файлами и каталогами

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Цели и задачи работы

Цель лабораторной работы

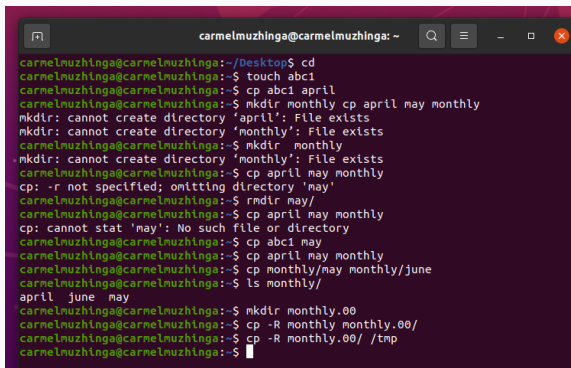
Ознакомление с файловой системой Linux, её структурой, именами и содержанием каталогов. Приобретение практических навыков по применению команд для работы с файлами и каталогами, по управлению процессами, по проверке использования диска и обслуживанию файловой системы.

Задачи лабораторной работы

- 1 Выполнить примеры
- 2 Выполнить действия по работе с каталогами и файлами
- 3 Выполнить действия с правами доступа
- 4 Получить дополнительные сведения при помощи справки по командам.

Процесс выполнения лабораторной работы

Выполнение примеров



```
carmelmuzhinga@carmelmuzhinga: ~  
carmelmuzhinga@carmelmuzhinga:~/Desktop$ cd  
carmelmuzhinga@carmelmuzhinga:~$ touch abc1  
carmelmuzhinga@carmelmuzhinga:~$ cp abc1 april  
carmelmuzhinga@carmelmuzhinga:~$ mkdir monthly cp april may monthly  
mkdir: cannot create directory 'april': File exists  
mkdir: cannot create directory 'monthly': File exists  
carmelmuzhinga@carmelmuzhinga:~$ mkdir monthly  
mkdir: cannot create directory 'monthly': File exists  
carmelmuzhinga@carmelmuzhinga:~$ cp april may monthly  
cp: -r not specified; omitting directory 'may'  
carmelmuzhinga@carmelmuzhinga:~$ rmdir may/  
carmelmuzhinga@carmelmuzhinga:~$ cp april may monthly  
cp: cannot stat 'may': No such file or directory  
carmelmuzhinga@carmelmuzhinga:~$ cp abc1 may  
carmelmuzhinga@carmelmuzhinga:~$ cp april may monthly  
carmelmuzhinga@carmelmuzhinga:~$ cp monthly/may monthly/june  
carmelmuzhinga@carmelmuzhinga:~$ ls monthly/  
april june may  
carmelmuzhinga@carmelmuzhinga:~$ mkdir monthly.00  
carmelmuzhinga@carmelmuzhinga:~$ cp -R monthly monthly.00/  
carmelmuzhinga@carmelmuzhinga:~$ cp -R monthly.00/ /tmp  
carmelmuzhinga@carmelmuzhinga:~$
```

Рис. 1: Выполнение примеров

Выполнение примеров

```
carneImuzhinga@carneImuzhinga:~$  
carneImuzhinga@carneImuzhinga:~$  
carneImuzhinga@carneImuzhinga:~$ mv april july  
carneImuzhinga@carneImuzhinga:~$ mv july monthly.00/  
carneImuzhinga@carneImuzhinga:~$ ls monthly.00/  
july  monthly  
carneImuzhinga@carneImuzhinga:~$ mv monthly.00/ monthly.01  
carneImuzhinga@carneImuzhinga:~$ mkdir reports  
carneImuzhinga@carneImuzhinga:~$ mv monthly.01/  
mv: missing destination file operand after 'monthly.01/'  
Try 'mv --help' for more information.  
carneImuzhinga@carneImuzhinga:~$ mv monthly.01/ reports/  
carneImuzhinga@carneImuzhinga:~$ mv reports/monthly.01/ reports/monthly  
carneImuzhinga@carneImuzhinga:~$
```

Рис. 2: Выполнение примеров

Выполнение примеров

```
carmelmuzhinga@carmelmuzhinga:~$  
carmelmuzhinga@carmelmuzhinga:~$ cd  
carmelmuzhinga@carmelmuzhinga:~$ touch may  
carmelmuzhinga@carmelmuzhinga:~$ ls -l may  
-rw-rw-r-- 1 carmelmuzhinga carmelmuzhinga 0 Mar  9 02:56 may  
carmelmuzhinga@carmelmuzhinga:~$ chmod u+x may  
carmelmuzhinga@carmelmuzhinga:~$ ls -l may  
-rwxrw-r-- 1 carmelmuzhinga carmelmuzhinga 0 Mar  9 02:56 may  
carmelmuzhinga@carmelmuzhinga:~$ chmod u-x may  
carmelmuzhinga@carmelmuzhinga:~$ ls -l may  
-rw-rw-r-- 1 carmelmuzhinga carmelmuzhinga 0 Mar  9 02:56 may  
carmelmuzhinga@carmelmuzhinga:~$ cd  
carmelmuzhinga@carmelmuzhinga:~$ mkdir monthly/  
mkdir: cannot create directory 'monthly/': File exists  
carmelmuzhinga@carmelmuzhinga:~$ chmod g-r,o-r monthly/  
carmelmuzhinga@carmelmuzhinga:~$ cd  
carmelmuzhinga@carmelmuzhinga:~$ touch abc1  
carmelmuzhinga@carmelmuzhinga:~$ chmod g+w abc1  
carmelmuzhinga@carmelmuzhinga:~$
```

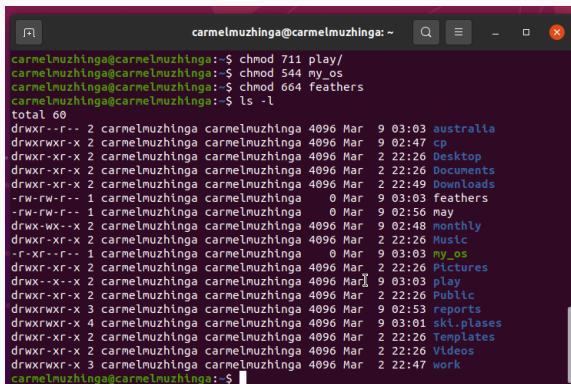
Рис. 3: Выполнение примеров

Создание директорий и копирование файлов

```
carmelnuzhinga@carmelnuzhinga:~$  
carmelnuzhinga@carmelnuzhinga:~$ cp /usr/include/linux/sysinfo.h ~  
carmelnuzhinga@carmelnuzhinga:~$ mv sysinfo.h equipment  
carmelnuzhinga@carmelnuzhinga:~$ mkdir ski.plases  
carmelnuzhinga@carmelnuzhinga:~$ mv equipment ski.plases/  
carmelnuzhinga@carmelnuzhinga:~$ mv ski.plases/equipment ski.plases/equiplist  
carmelnuzhinga@carmelnuzhinga:~$ touch abc1  
carmelnuzhinga@carmelnuzhinga:~$ mv abc1 ski.plases/equiplist2  
carmelnuzhinga@carmelnuzhinga:~$ cd ski.plases/  
carmelnuzhinga@carmelnuzhinga:~/ski.plases$ mkdir equipment  
carmelnuzhinga@carmelnuzhinga:~/ski.plases$ mv equiplist equipment/  
carmelnuzhinga@carmelnuzhinga:~/ski.plases$ mv equiplist2 equipment/  
carmelnuzhinga@carmelnuzhinga:~/ski.plases$ cd  
carmelnuzhinga@carmelnuzhinga:~$ mkdir newdir  
carmelnuzhinga@carmelnuzhinga:~$ mv newdir ski.plases/  
carmelnuzhinga@carmelnuzhinga:~$ mv ski.plases/newdir/ ski.plases/plans  
carmelnuzhinga@carmelnuzhinga:~$
```

Рис. 4: Работа с каталогами

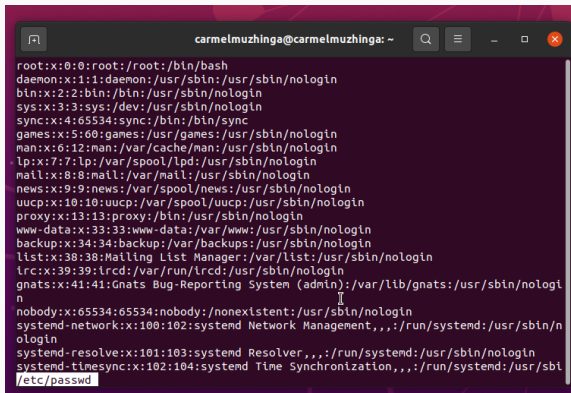
Работа с командой chmod



```
carmelmuzhinga@carmelmuzhinga: ~  
carmelmuzhinga@carmelmuzhinga:~$ chmod 711 play/  
carmelmuzhinga@carmelmuzhinga:~$ chmod 544 my_os  
carmelmuzhinga@carmelmuzhinga:~$ chmod 664 feathers  
carmelmuzhinga@carmelmuzhinga:~$ ls -l  
total 60  
drwxr--r-- 2 carmelmuzhinga carmelmuzhinga 4096 Mar 9 03:03 australia  
drwxrwxr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 9 02:47 cp  
drwxr-xr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:26 Desktop  
drwxr-xr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:26 Documents  
drwxr-xr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:49 Downloads  
-rw-rw-r-- 1 carmelmuzhinga carmelmuzhinga 0 Mar 9 03:03 feathers  
-rw-rw-r-- 1 carmelmuzhinga carmelmuzhinga 0 Mar 9 02:56 may  
drwx-wx--x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 9 02:48 monthly  
drwxr-xr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:26 Music  
-r-xr--r-- 1 carmelmuzhinga carmelmuzhinga 0 Mar 9 03:03 my_os  
drwxr-xr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:26 Pictures  
drwx--x--x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 9 03:03 play  
drwxr-xr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:26 Public  
drwxrwxr-x 3 carmelmuzhinga carmelmuzhinga 4096 Mar 9 02:53 reports  
drwxrwxr-x 4 carmelmuzhinga carmelmuzhinga 4096 Mar 9 03:01 ski.plases  
drwxr-xr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:26 Templates  
drwxr-xr-x 2 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:26 Videos  
drwxrwxr-x 3 carmelmuzhinga carmelmuzhinga 4096 Mar 2 22:47 work  
carmelmuzhinga@carmelmuzhinga:~$
```

Рис. 5: Настройка прав доступа

Файл /etc/passwd

A terminal window with a dark purple background and light green text. The window title is 'carmelmuzhinga@carmelmuzhinga: ~'. The terminal displays the contents of the /etc/passwd file, showing system users and their configurations. The text is as follows:

```
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailng List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
```

The last line, `/etc/passwd`, is highlighted with a light blue background.

Рис. 6: Файл /etc/passwd

Работа с файлами и правами доступа

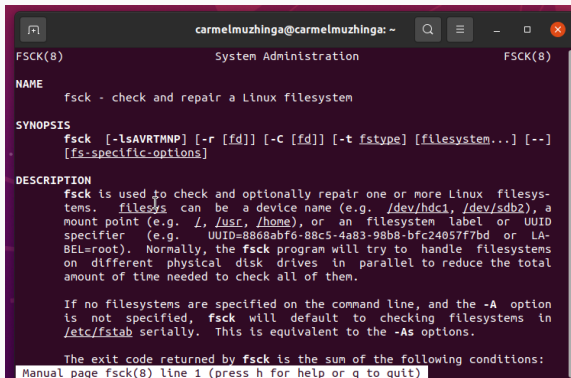
```
carmelnuzhinga@carmelnuzhinga:~$  
carmelnuzhinga@carmelnuzhinga:~$ cp feathers file.old  
carmelnuzhinga@carmelnuzhinga:~$ mv file.old play/  
carmelnuzhinga@carmelnuzhinga:~$ mkdir fun  
carmelnuzhinga@carmelnuzhinga:~$ cp -R play fun/games  
carmelnuzhinga@carmelnuzhinga:~$ cp -R play fun/  
carmelnuzhinga@carmelnuzhinga:~$ mv fun/ play/games  
carmelnuzhinga@carmelnuzhinga:~$ chmod -r feathers  
carmelnuzhinga@carmelnuzhinga:~$ cat feathers  
cat: feathers: Permission denied  
carmelnuzhinga@carmelnuzhinga:~$ cp feathers feathers2  
cp: cannot open 'feathers' for reading: Permission denied  
carmelnuzhinga@carmelnuzhinga:~$ chmod +r feathers  
carmelnuzhinga@carmelnuzhinga:~$ chmod -x play/  
carmelnuzhinga@carmelnuzhinga:~$ cd play/  
bash: cd: play/: Permission denied  
carmelnuzhinga@carmelnuzhinga:~$ chmod +x play/  
carmelnuzhinga@carmelnuzhinga:~$
```

Рис. 7: Работа с файлами и правами доступа



```
carmelmuzhinga@carmelmuzhinga: ~  
MOUNT(8) System Administration MOUNT(8)  
  
NAME  
    mount - mount a filesystem  
  
SYNOPSIS  
    mount [-l|-h|-V]  
  
    mount -a [-ffnrsvw] [-t fstype] [-O optlist]  
  
    mount [-fnrsvw] [-o options] device|dir  
  
    mount [-fnrsvw] [-t fstype] [-o options] device dir  
  
DESCRIPTION  
    All files accessible in a Unix system are arranged in one big tree, the  
    file hierarchy, rooted at /. These files can be spread out over several  
    devices. The mount command serves to attach the filesystem found on  
    some device to the big file tree. Conversely, the umount(8) command  
    will detach it again. The filesystem is used to control how data is  
    stored on the device or provided in a virtual way by network or another  
    services.  
  
Manual page mount(8) line 1 (press h for help or q to quit)
```

Рис. 8: Команда mount



```
FSCK(8)                                     System Administration                                FSCK(8)

NAME
    fsck - check and repair a Linux filesystem

SYNOPSIS
    fsck [-lsAVRTMNP] [-r [fd]] [-C [fd]] [-t fstype] [filesystem...] [--]
    [fs-specific-options]

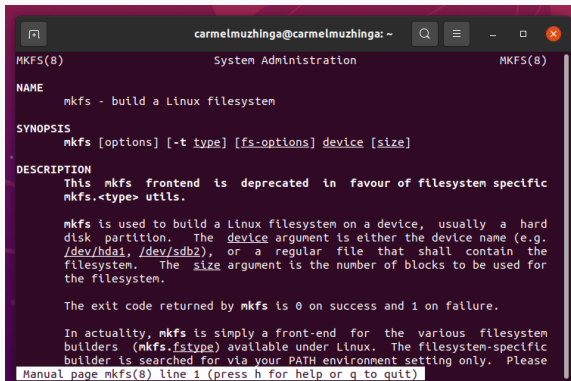
DESCRIPTION
    fsck is used to check and optionally repair one or more Linux filesystems.
    filesystems can be a device name (e.g. /dev/hdc1, /dev/sdb2), a mount point
    (e.g. /, /usr, /home), or an filesystem label or UUID specifier (e.g.
    UUID=8868abf6-88c5-4a83-98b8-bfc24057f7bd or LABEL=root). Normally, the
    fsck program will try to handle filesystems on different physical disk
    drives in parallel to reduce the total amount of time needed to check all
    of them.

    If no filesystems are specified on the command line, and the -A option is
    not specified, fsck will default to checking filesystems in /etc/fstab
    serially. This is equivalent to the -As options.

    The exit code returned by fsck is the sum of the following conditions:

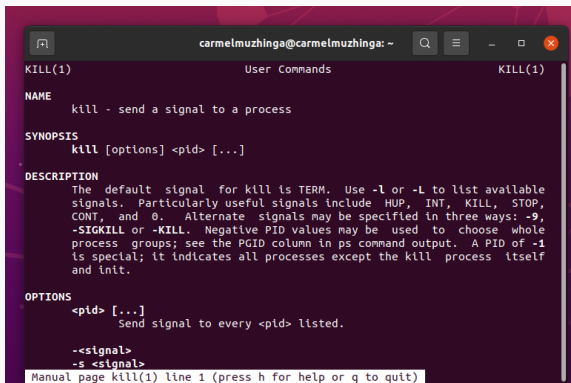
Manual page fsck(8) line 1 (press h for help or q to quit)
```

Рис. 9: Команда fsck



```
cartermuzhinga@cartermuzhinga: ~  
MKFS(8) System Administration MKFS(8)  
  
NAME  
mkfs - build a Linux filesystem  
  
SYNOPSIS  
mkfs [options] [-t type] [fs-options] device [size]  
  
DESCRIPTION  
This mkfs frontend is deprecated in favour of filesystem specific  
mkfs.<type> utils.  
  
mkfs is used to build a Linux filesystem on a device, usually a hard  
disk partition. The device argument is either the device name (e.g.  
/dev/hda1, /dev/sdb2), or a regular file that shall contain the  
filesystem. The size argument is the number of blocks to be used for  
the filesystem.  
  
The exit code returned by mkfs is 0 on success and 1 on failure.  
  
In actuality, mkfs is simply a front-end for the various filesystem  
builders (mkfs.fstype) available under Linux. The filesystem-specific  
builder is searched for via your PATH environment setting only. Please  
Manual page mkfs(8) line 1 (press h for help or q to quit)
```

Рис. 10: Команда mkfs



```
carmelmuzhinga@carmelmuzhinga: ~  
KILL(1) User Commands KILL(1)  
  
NAME  
    kill - send a signal to a process  
  
SYNOPSIS  
    kill [options] <pid> [...]  
  
DESCRIPTION  
    The default signal for kill is TERM. Use -l or -L to list available  
    signals. Particularly useful signals include HUP, INT, KILL, STOP,  
    CONT, and 0. Alternate signals may be specified in three ways: -9,  
    -SIGKILL or -KILL. Negative PID values may be used to choose whole  
    process groups; see the PGID column in ps command output. A PID of -1  
    is special; it indicates all processes except the kill process itself  
    and init.  
  
OPTIONS  
    <pid> [...]  
        Send signal to every <pid> listed.  
  
    -<signal>  
    -s <signal>  
Manual page kill(1) line 1 (press h for help or q to quit)
```

Рис. 11: Команда kill

Выводы по проделанной работе

В ходе данной работы мы ознакомились с файловой системой Linux, её структурой, именами и содержанием каталогов. Научились совершать базовые операции с файлами, управлять правами их доступа для пользователя и групп. Ознакомились с Анализом файловой системы. А также получили базовые навыки по проверке использования диска и обслуживанию файловой системы.