

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

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Цели и задачи работы

Цель лабораторной работы

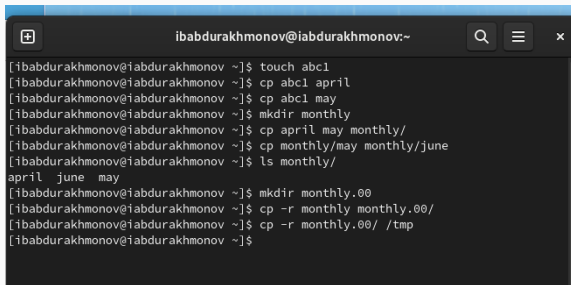
Ознакомление с файловой системой Linux, её структурой, именами и содержанием каталогов. Приобретение практических навыков по применению команд для работы с файлами и каталогами, по управлению процессами, по проверке использования диска и обслуживанию файловой системы.

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



```
ibabdurakhmonov@iabdurakhmonov:~  
[ibabdurakhmonov@iabdurakhmonov ~]$ touch abc1  
[ibabdurakhmonov@iabdurakhmonov ~]$ cp abc1 april  
[ibabdurakhmonov@iabdurakhmonov ~]$ cp abc1 may  
[ibabdurakhmonov@iabdurakhmonov ~]$ mkdir monthly  
[ibabdurakhmonov@iabdurakhmonov ~]$ cp april may monthly/  
[ibabdurakhmonov@iabdurakhmonov ~]$ cp monthly/may monthly/june  
[ibabdurakhmonov@iabdurakhmonov ~]$ ls monthly/  
april  june  may  
[ibabdurakhmonov@iabdurakhmonov ~]$ mkdir monthly.00  
[ibabdurakhmonov@iabdurakhmonov ~]$ cp -r monthly monthly.00/  
[ibabdurakhmonov@iabdurakhmonov ~]$ cp -r monthly.00/ /tmp  
[ibabdurakhmonov@iabdurakhmonov ~]$
```

Рис. 1: Выполнение примеров

Выполнение примеров

```
[ibabdurakhmonov@iabdurakhmonov ~]$ mkdir monthly.00
[ibabdurakhmonov@iabdurakhmonov ~]$ cp -r monthly monthly.00/
[ibabdurakhmonov@iabdurakhmonov ~]$ cp -r monthly.00/ /tmp
[ibabdurakhmonov@iabdurakhmonov ~]$
[ibabdurakhmonov@iabdurakhmonov ~]$ mv april july
[ibabdurakhmonov@iabdurakhmonov ~]$ mv july monthly.00
[ibabdurakhmonov@iabdurakhmonov ~]$ ls monthly.00/
july  monthly
[ibabdurakhmonov@iabdurakhmonov ~]$ mv monthly.00/ monthly.01
[ibabdurakhmonov@iabdurakhmonov ~]$ mkdir reports
[ibabdurakhmonov@iabdurakhmonov ~]$ mv monthly.01 reports/
[ibabdurakhmonov@iabdurakhmonov ~]$ mv reports/monthly.01/ reports/monthly
[ibabdurakhmonov@iabdurakhmonov ~]$
```

Рис. 2: Выполнение примеров

Выполнение примеров

```
[ibabdurakhmonov@iabdurakhmonov ~]$  
[ibabdurakhmonov@iabdurakhmonov ~]$  
[ibabdurakhmonov@iabdurakhmonov ~]$ touch may  
[ibabdurakhmonov@iabdurakhmonov ~]$ ls -l may  
-rw-r--r--. 1 ibabdurakhmonov ibabdurakhmonov 0 мар  7 12:31 may  
[ibabdurakhmonov@iabdurakhmonov ~]$ chmod u+x may  
[ibabdurakhmonov@iabdurakhmonov ~]$ ls -l may  
-rwxr--r--. 1 ibabdurakhmonov ibabdurakhmonov 0 мар  7 12:31 may  
[ibabdurakhmonov@iabdurakhmonov ~]$ chmod u-x may  
[ibabdurakhmonov@iabdurakhmonov ~]$ ls -l may  
-rw-r--r--. 1 ibabdurakhmonov ibabdurakhmonov 0 мар  7 12:31 may  
[ibabdurakhmonov@iabdurakhmonov ~]$ mkdir monthly  
mkdir: невозможно создать каталог «monthly»: Файл существует  
[ibabdurakhmonov@iabdurakhmonov ~]$ chmod g-r, o-r monthly/  
chmod: неверный режим: «g-r,»  
По команде «chmod --help» можно получить дополнительную информацию.  
[ibabdurakhmonov@iabdurakhmonov ~]$ chmod g-r,o-r monthly/  
[ibabdurakhmonov@iabdurakhmonov ~]$ chmod g+w abc1  
[ibabdurakhmonov@iabdurakhmonov ~]$
```

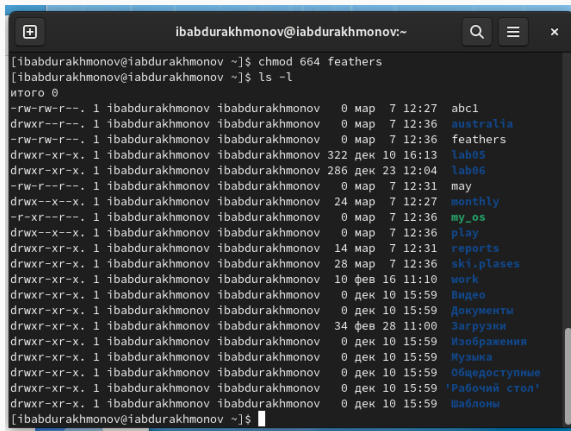
Рис. 3: Выполнение примеров

Создание директорий и копирование файлов

```
[ibabdurakhmonov@iabdurakhmonov ~]$ cp /usr/include/linux/sysinfo.h ~
[ibabdurakhmonov@iabdurakhmonov ~]$ ms sysinfo.h equipment
bash: ms: команда не найдена...
Аналогичная команда: 'мс'
[ibabdurakhmonov@iabdurakhmonov ~]$ mv sysinfo.h equipment
[ibabdurakhmonov@iabdurakhmonov ~]$ mkdir ski.plases
[ibabdurakhmonov@iabdurakhmonov ~]$ mv equipment ski.plases/
[ibabdurakhmonov@iabdurakhmonov ~]$ mv ski.plases/equipment ski.plases/equiplist
[ibabdurakhmonov@iabdurakhmonov ~]$ cp abc1 ski.plases/equiplist2
[ibabdurakhmonov@iabdurakhmonov ~]$ cd ski.plases/
[ibabdurakhmonov@iabdurakhmonov ski.plases]$ mkdir equipment
[ibabdurakhmonov@iabdurakhmonov ski.plases]$ mv equiplist equipment/
[ibabdurakhmonov@iabdurakhmonov ski.plases]$ mv equiplist2 equipment/
[ibabdurakhmonov@iabdurakhmonov ski.plases]$ cd
[ibabdurakhmonov@iabdurakhmonov ~]$ mkdir newdir
[ibabdurakhmonov@iabdurakhmonov ~]$ mv newdir ski.plases/
[ibabdurakhmonov@iabdurakhmonov ~]$ mv ski.plases/newdir/ ski.plases/plans
[ibabdurakhmonov@iabdurakhmonov ~]$
```

Рис. 4: Работа с каталогами

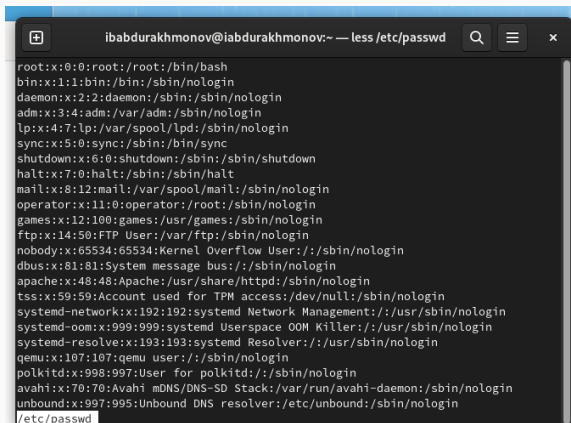
Работа с командой chmod



```
ibabdurakhmonov@ibabdurakhmonov:~  
[ibabdurakhmonov@ibabdurakhmonov ~]$ chmod 664 feathers  
[ibabdurakhmonov@ibabdurakhmonov ~]$ ls -l  
итого 0  
-rw-rw-r--. 1 ibabdurakhmonov ibabdurakhmonov 0 map 7 12:27 abc1  
drwxr--r--. 1 ibabdurakhmonov ibabdurakhmonov 0 map 7 12:36 australia  
-rw-rw-r--. 1 ibabdurakhmonov ibabdurakhmonov 0 map 7 12:36 feathers  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 322 дек 10 16:13 lab05  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 286 дек 23 12:04 lab06  
-rw-r--r--. 1 ibabdurakhmonov ibabdurakhmonov 0 map 7 12:31 may  
drwx--x--x. 1 ibabdurakhmonov ibabdurakhmonov 24 map 7 12:27 monthly  
-r-xr--r--. 1 ibabdurakhmonov ibabdurakhmonov 0 map 7 12:36 my_os  
drwx--x--x. 1 ibabdurakhmonov ibabdurakhmonov 0 map 7 12:36 play  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 14 map 7 12:31 reports  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 28 map 7 12:36 ski.places  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 10 фев 16 11:10 work  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 0 дек 10 15:59 Видео  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 0 дек 10 15:59 Документы  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 34 фев 28 11:00 Загрузки  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 0 дек 10 15:59 Изображения  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 0 дек 10 15:59 Музыка  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 0 дек 10 15:59 Общедоступные  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 0 дек 10 15:59 'Рабочий стол'  
drwxr-xr-x. 1 ibabdurakhmonov ibabdurakhmonov 0 дек 10 15:59 Шаблоны  
[ibabdurakhmonov@ibabdurakhmonov ~]$
```

Рис. 5: Настройка прав доступа

Файл /etc/passwd



The image shows a terminal window with the title bar "ibabdurakhmonov@iabdurakhmonov:~ — less /etc/passwd". The terminal displays the contents of the /etc/passwd file, which lists system and user accounts in a colon-separated format. The accounts listed are: root, bin, daemon, adm, lp, sync, shutdown, halt, mail, operator, games, ftp, nobody, dbus, apache, tss, systemd-network, systemd-oom, systemd-resolve, qemu, polkitd, avahi, and unbound. Each entry includes a username, a numeric UID, a numeric GID, a username, a home directory, and a shell path.

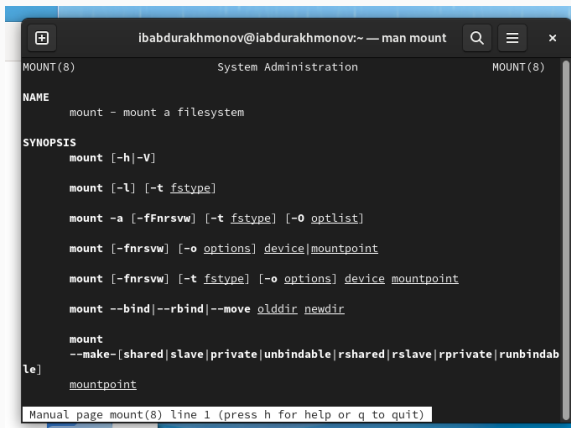
```
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
games:x:12:100:games:/usr/games:/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/sbin/nologin
nobody:x:65534:65534:Kernel Overflow User:/sbin/nologin
dbus:x:81:81:System message bus:/sbin/nologin
apache:x:48:48:Apache:/usr/share/httpd:/sbin/nologin
tss:x:59:59:Account used for TPM access:/dev/null:/sbin/nologin
systemd-network:x:192:192:systemd Network Management:/usr/sbin/nologin
systemd-oom:x:999:999:systemd Userspace OOM Killer:/usr/sbin/nologin
systemd-resolve:x:193:193:systemd Resolver:/usr/sbin/nologin
qemu:x:107:107:qemu user:/sbin/nologin
polkitd:x:998:997:User for polkitd:/sbin/nologin
avahi:x:70:70:Avahi mDNS-DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
unbound:x:997:995:Unbound DNS resolver:/etc/unbound:/sbin/nologin
```

Рис. 6: Файл /etc/passwd

Работа с файлами и правами доступа

```
[ibabdurakhmonov@ibabdurakhmonov ~]$  
[ibabdurakhmonov@ibabdurakhmonov ~]$  
[ibabdurakhmonov@ibabdurakhmonov ~]$ cp feathers file.old  
[ibabdurakhmonov@ibabdurakhmonov ~]$ mv file.old play/  
[ibabdurakhmonov@ibabdurakhmonov ~]$ mkdir fun  
[ibabdurakhmonov@ibabdurakhmonov ~]$ cp -R play/ fun/  
[ibabdurakhmonov@ibabdurakhmonov ~]$ chmod u-r feathers  
[ibabdurakhmonov@ibabdurakhmonov ~]$ cat feathers  
cat: feathers: Отказано в доступе  
[ibabdurakhmonov@ibabdurakhmonov ~]$ cp feathers feathers2  
cp: невозможно открыть 'feathers' для чтения: Отказано в доступе  
[ibabdurakhmonov@ibabdurakhmonov ~]$ chmod u+r feathers  
[ibabdurakhmonov@ibabdurakhmonov ~]$ chmod -x play  
[ibabdurakhmonov@ibabdurakhmonov ~]$ cd play/  
bash: cd: play/: Отказано в доступе  
[ibabdurakhmonov@ibabdurakhmonov ~]$ chmod +x play  
[ibabdurakhmonov@ibabdurakhmonov ~]$
```

Рис. 7: Работа с файлами и правами доступа



The screenshot shows a terminal window titled "ibabdurakhmonov@iabdurakhmonov:~ — man mount". The window displays the manual page for the 'mount' command. The content is as follows:

```
MOUNT(8)                                System Administration                                MOUNT(8)

NAME
    mount - mount a filesystem

SYNOPSIS
    mount [-h|-V]

    mount [-l] [-t fstype]

    mount -a [-fFnrsvw] [-t fstype] [-O optlist]

    mount [-fnrsvw] [-o options] device|mountpoint

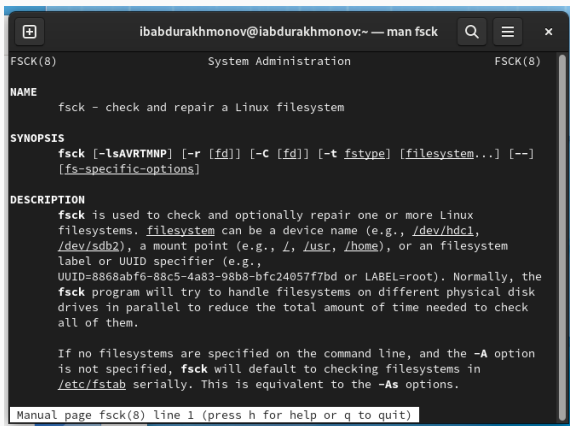
    mount [-fnrsvw] [-t fstype] [-o options] device mountpoint

    mount --bind|--rbind|--move olddir newdir

    mount
    --make-[shared|slave|private|unbindable|rshared|rslave|rprivate|runbindable]
    mountpoint

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

Рис. 8: Команда mount



```
ibabdurakhmonov@iabdurakhmonov:~ — man fsck
FSCK(8)                                System Administration                                FSCK(8)

NAME
    fsck - check and repair a Linux filesystem

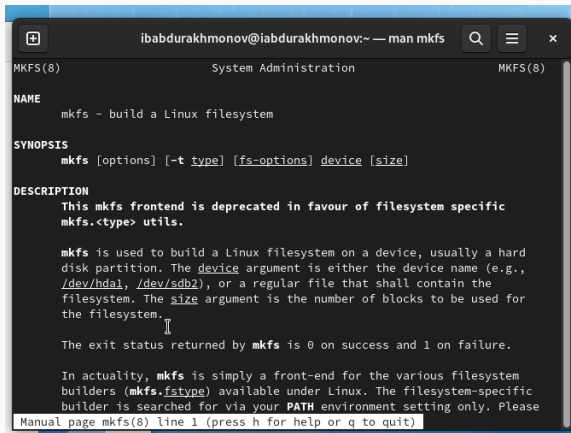
SYNOPSIS
    fsck [-lsAVRTMNP] [-r [fd]] [-C [fd]] [-t fstype] [filesystem...] [--]
    [fs-specific-options]

DESCRIPTION
    fsck is used to check and optionally repair one or more Linux
    filesystems. filesystem 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.

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

Рис. 9: Команда fsck



```
ibabdurakhmonov@iabdurakhmonov:~ — man mkfs
```

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.

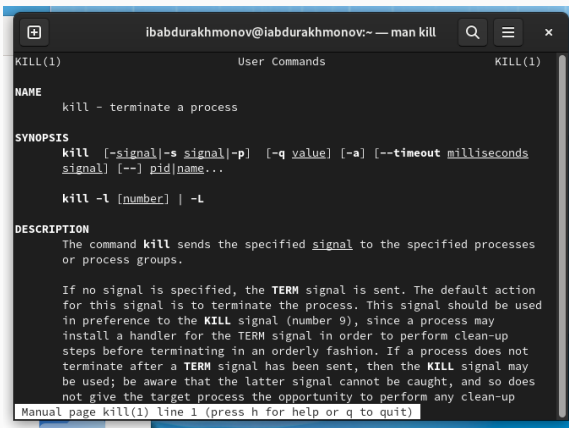
mkfs is used to build a Linux filesystem on a device, usually a hard disk partition. The device argument is either the device name (e.g., /dev/hda1, /dev/sdb2), or a regular file that shall contain the filesystem. The size argument is the number of blocks to be used for the filesystem.

The exit status 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



```
ibabdurakhmonov@ibabdurakhmonov:~ — man kill
KILL(1) User Commands KILL(1)

NAME
    kill - terminate a process

SYNOPSIS
    kill [-signal|-s signal|-p] [-q value] [-a] [--timeout milliseconds
    signal] [--] pid|name...

    kill -l [number] | -L

DESCRIPTION
    The command kill sends the specified signal to the specified processes
    or process groups.

    If no signal is specified, the TERM signal is sent. The default action
    for this signal is to terminate the process. This signal should be used
    in preference to the KILL signal (number 9), since a process may
    install a handler for the TERM signal in order to perform clean-up
    steps before terminating in an orderly fashion. If a process does not
    terminate after a TERM signal has been sent, then the KILL signal may
    be used; be aware that the latter signal cannot be caught, and so does
    not give the target process the opportunity to perform any clean-up

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.