Операционные системы

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 приимеры

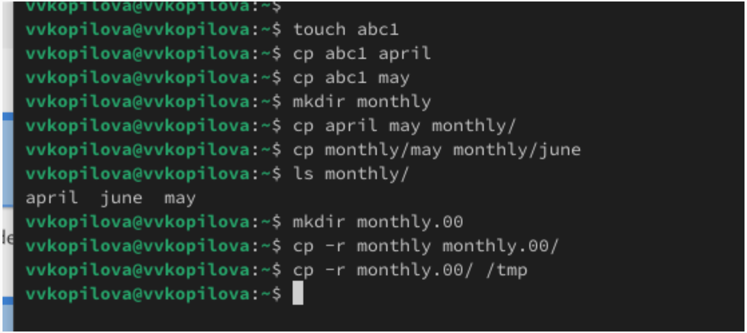
2 Выполнить дествия по работе с каталогами и файлами

3 Выполнить действия с правами доступа

4 Получить дополнительные сведения при помощи справки по командам.

Процесс выполнения лабораторной работы

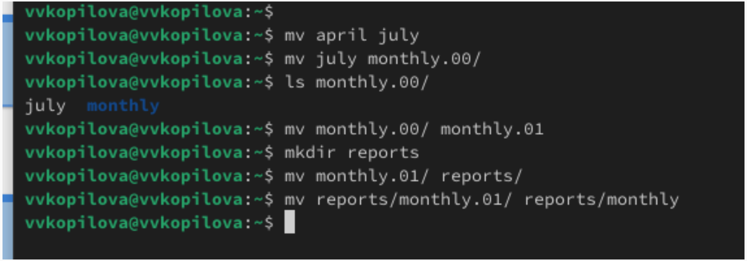
Выполнение примеров



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

Рис. 1: Выполнение примеров

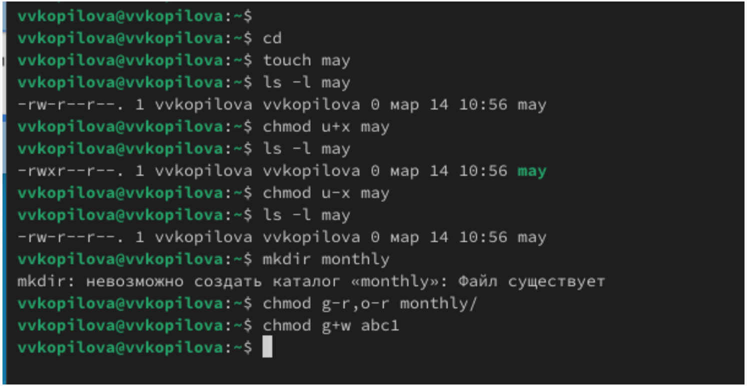
Выполнение примеров



```
vvkopilova@vvkopilova:~$
vvkopilova@vvkopilova:~$ mv april july
vvkopilova@vvkopilova:~$ mv july monthly.00/
vvkopilova@vvkopilova:~$ ls monthly.00/
july  monthly
vvkopilova@vvkopilova:~$ mv monthly.00/ monthly.01
vvkopilova@vvkopilova:~$ mkdir reports
vvkopilova@vvkopilova:~$ mv monthly.01/ reports/
vvkopilova@vvkopilova:~$ mv reports/monthly.01/ reports/monthly
vvkopilova@vvkopilova:~$
```

Рис. 2: Выполнение примеров

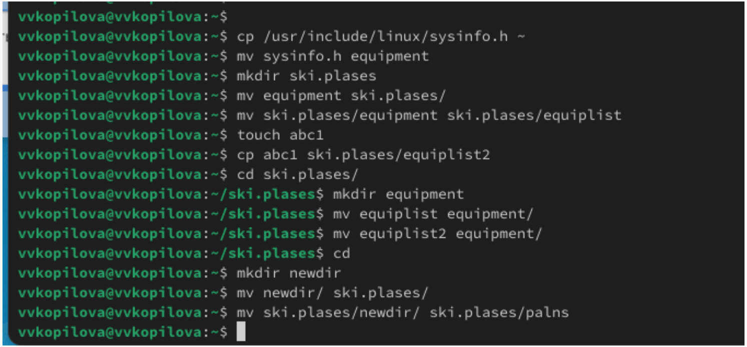
Выполнение примеров



```
vvkopilova@vvkopilova:~$
vvkopilova@vvkopilova:~$ cd
vvkopilova@vvkopilova:~$ touch may
vvkopilova@vvkopilova:~$ ls -l may
-rw-r--r--. 1 vvkopilova vvkopilova 0 мар 14 10:56 may
vvkopilova@vvkopilova:~$ chmod u+x may
vvkopilova@vvkopilova:~$ ls -l may
-rwxr--r--. 1 vvkopilova vvkopilova 0 мар 14 10:56 may
vvkopilova@vvkopilova:~$ chmod u-x may
vvkopilova@vvkopilova:~$ ls -l may
-rw-r--r--. 1 vvkopilova vvkopilova 0 мар 14 10:56 may
vvkopilova@vvkopilova:~$ mkdir monthly
mkdir: невозможно создать каталог «monthly»: Файл существует
vvkopilova@vvkopilova:~$ chmod g-r,o-r monthly/
vvkopilova@vvkopilova:~$ chmod g+w abc1
vvkopilova@vvkopilova:~$
```

Рис. 3: Выполнение примеров

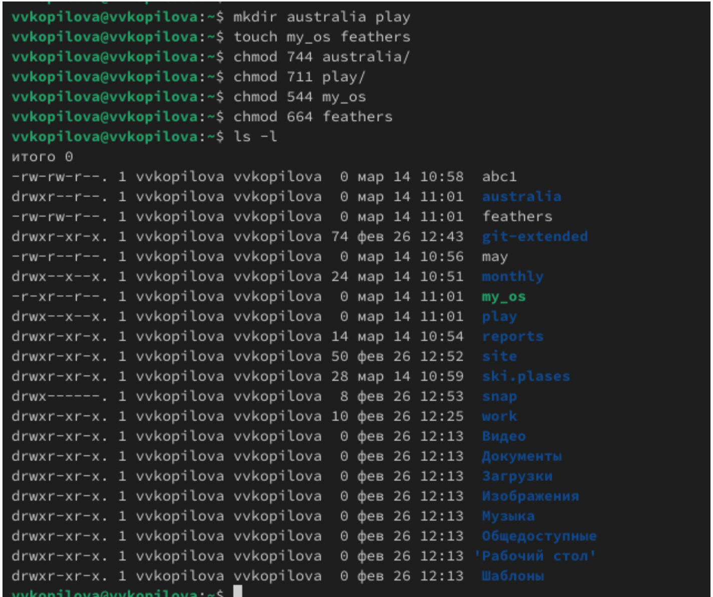
Создание директорий и копирование файлов



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

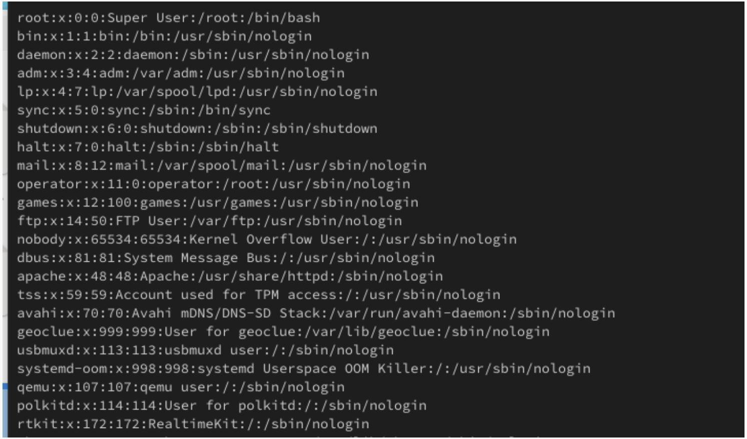
Рис. 4: Работа с каталогами

Работа с командой chmod



```
vvkopilova@vvkopilova:~$ mkdir australia play
vvkopilova@vvkopilova:~$ touch my_os feathers
vvkopilova@vvkopilova:~$ chmod 744 australia/
vvkopilova@vvkopilova:~$ chmod 711 play/
vvkopilova@vvkopilova:~$ chmod 544 my_os
vvkopilova@vvkopilova:~$ chmod 664 feathers
vvkopilova@vvkopilova:~$ ls -l
итого 0
-rw-rw-r--. 1 vvkopilova vvkopilova  0 мар 14 10:58  abc1
drwxr--r--. 1 vvkopilova vvkopilova  0 мар 14 11:01  australia
-rw-rw-r--. 1 vvkopilova vvkopilova  0 мар 14 11:01  feathers
drwxr-xr-x. 1 vvkopilova vvkopilova 74 фев 26 12:43  git-extended
-rw-r--r--. 1 vvkopilova vvkopilova  0 мар 14 10:56  may
drwx--x--x. 1 vvkopilova vvkopilova 24 мар 14 10:51  monthly
-r-xr--r--. 1 vvkopilova vvkopilova  0 мар 14 11:01  my_os
drwx--x--x. 1 vvkopilova vvkopilova  0 мар 14 11:01  play
drwxr-xr-x. 1 vvkopilova vvkopilova 14 мар 14 10:54  reports
drwxr-xr-x. 1 vvkopilova vvkopilova 50 фев 26 12:52  site
drwxr-xr-x. 1 vvkopilova vvkopilova 28 мар 14 10:59  ski.plases
drwx------. 1 vvkopilova vvkopilova  8 фев 26 12:53  snap
drwxr-xr-x. 1 vvkopilova vvkopilova 10 фев 26 12:25  work
drwxr-xr-x. 1 vvkopilova vvkopilova  0 фев 26 12:13  Видео
drwxr-xr-x. 1 vvkopilova vvkopilova  0 фев 26 12:13  Документы
drwxr-xr-x. 1 vvkopilova vvkopilova  0 фев 26 12:13  Загрузки
drwxr-xr-x. 1 vvkopilova vvkopilova  0 фев 26 12:13  Изображения
drwxr-xr-x. 1 vvkopilova vvkopilova  0 фев 26 12:13  Музыка
drwxr-xr-x. 1 vvkopilova vvkopilova  0 фев 26 12:13  Общедоступные
drwxr-xr-x. 1 vvkopilova vvkopilova  0 фев 26 12:13 'Рабочий стол'
drwxr-xr-x. 1 vvkopilova vvkopilova  0 фев 26 12:13  Шаблоны
vvkopilova@vvkopilova:~$
```

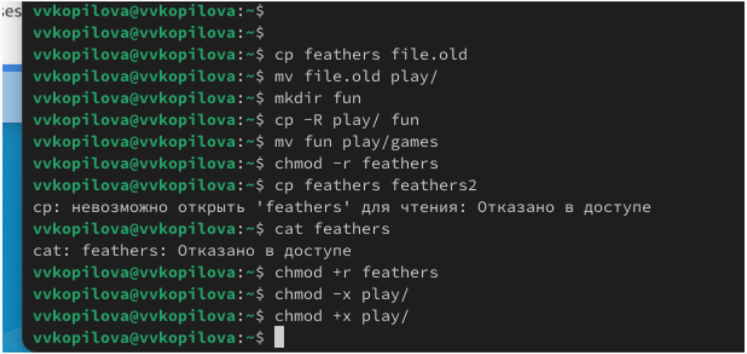
Файл /etc/passwd



```
root:x:0:0:Super User:/root:/bin/bash
bin:x:1:1:bin:/bin:/usr/sbin/nologin
daemon:x:2:2:daemon:/sbin:/usr/sbin/nologin
adm:x:3:4:adm:/var/adm:/usr/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/usr/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:/usr/sbin/nologin
operator:x:11:0:operator:/root:/usr/sbin/nologin
games:x:12:100:games:/usr/games:/usr/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/usr/sbin/nologin
nobody:x:65534:65534:Kernel Overflow User:/:/usr/sbin/nologin
dbus:x:81:81:System Message Bus:/:/usr/sbin/nologin
apache:x:48:48:Apache:/usr/share/httpd:/sbin/nologin
tss:x:59:59:Account used for TPM access:/:/usr/sbin/nologin
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
geoclue:x:999:999:User for geoclue:/var/lib/geoclue:/sbin/nologin
usbmuxd:x:113:113:usbmuxd user:/:/sbin/nologin
systemd-oom:x:998:998:systemd Userspace OOM Killer:/:/usr/sbin/nologin
qemu:x:107:107:qemu user:/:/sbin/nologin
polkitd:x:114:114:User for polkitd:/:/sbin/nologin
rtkit:x:172:172:RealtimeKit:/:/sbin/nologin
```

Рис. 6: Файл /etc/passwd

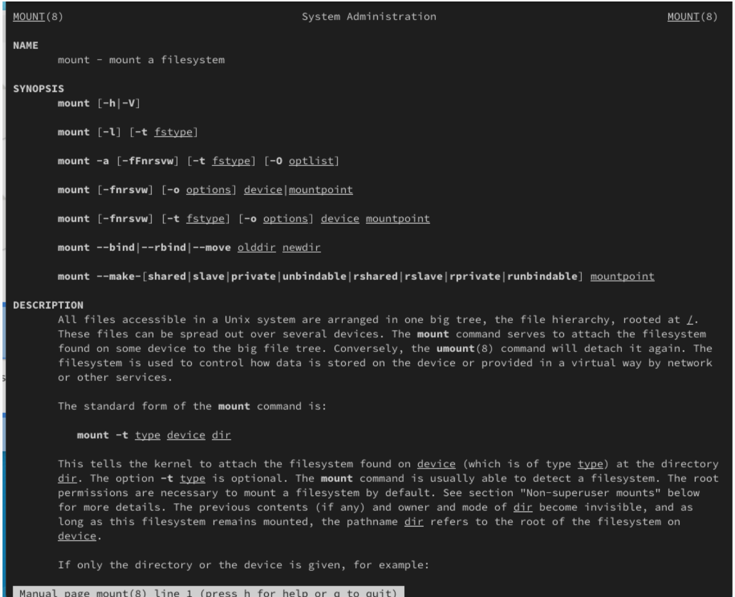
Работа с файлами и правами доступа



```
vvkopilova@vvkopilova:~$
vvkopilova@vvkopilova:~$
vvkopilova@vvkopilova:~$ cp feathers file.old
vvkopilova@vvkopilova:~$ mv file.old play/
vvkopilova@vvkopilova:~$ mkdir fun
vvkopilova@vvkopilova:~$ cp -R play/ fun
vvkopilova@vvkopilova:~$ mv fun play/games
vvkopilova@vvkopilova:~$ chmod -r feathers
vvkopilova@vvkopilova:~$ cp feathers feathers2
cp: невозможно открыть 'feathers' для чтения: Отказано в доступе
vvkopilova@vvkopilova:~$ cat feathers
cat: feathers: Отказано в доступе
vvkopilova@vvkopilova:~$ chmod +r feathers
vvkopilova@vvkopilova:~$ chmod -x play/
vvkopilova@vvkopilova:~$ chmod +x play/
vvkopilova@vvkopilova:~$
```

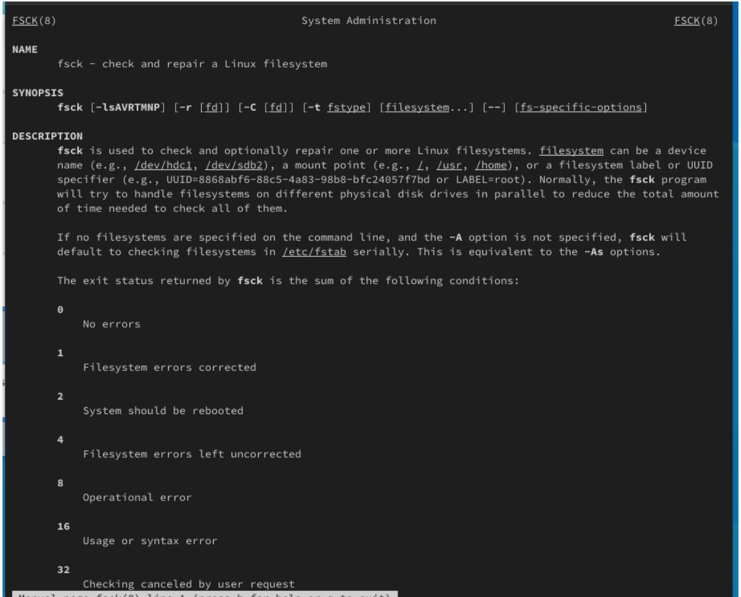
Рис. 7: Работа с файлами и правами доступа

Справка по командам



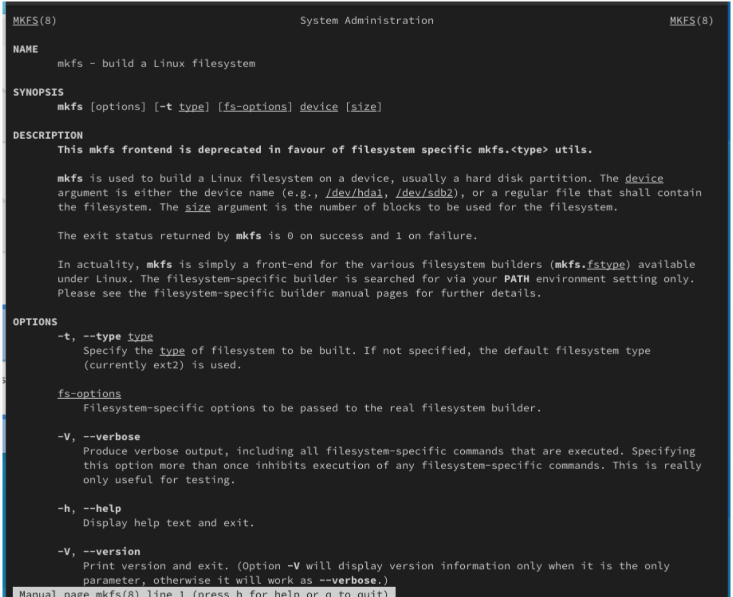
```
MOUNT(8)                        System Administration                        MOUNT(8)

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

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 other services.

       The standard form of the mount command is:

          mount -t type device dir

       This tells the kernel to attach the filesystem found on device (which is of type type) at the directory
       dir. The option -t type is optional. The mount command is usually able to detect a filesystem. The root
       permissions are necessary to mount a filesystem by default. See section "Non-superuser mounts" below
       for more details. The previous contents (if any) and owner and mode of dir become invisible, and as
       long as this filesystem remains mounted, the pathname dir refers to the root of the filesystem on
       device.

       If only the directory or the device is given, for example:

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

Справка по командам



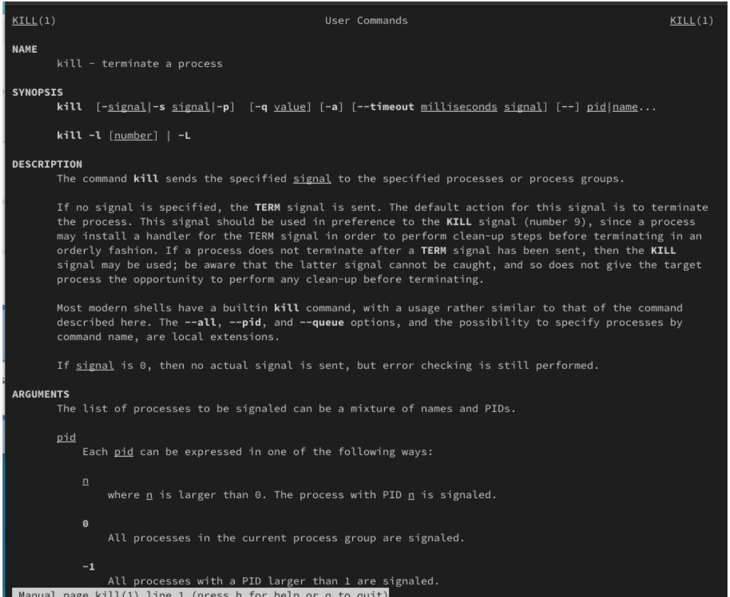
```
FSCK(8)                              System Administration                              FSCK(8)

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 a 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 status returned by fsck is the sum of the following conditions:

       0
           No errors

       1
           Filesystem errors corrected

       2
           System should be rebooted

       4
           Filesystem errors left uncorrected

       8
           Operational error

       16
           Usage or syntax error

       32
           Checking canceled by user request
 Manual page fsck(8) line 1 (press h for help or q to quit)
```

Справка по командам



```
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 see the filesystem-specific builder manual pages for further details.

OPTIONS
       -t, --type type
           Specify the type of filesystem to be built. If not specified, the default filesystem type
           (currently ext2) is used.

       fs-options
           Filesystem-specific options to be passed to the real filesystem builder.

       -V, --verbose
           Produce verbose output, including all filesystem-specific commands that are executed. Specifying
           this option more than once inhibits execution of any filesystem-specific commands. This is really
           only useful for testing.

       -h, --help
           Display help text and exit.

       -V, --version
           Print version and exit. (Option -V will display version information only when it is the only
           parameter, otherwise it will work as --verbose.)
 Manual page mkfs(8) line 1 (press h for help or q to quit)
```

Справка по командам



```
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 before terminating.

       Most modern shells have a builtin kill command, with a usage rather similar to that of the command
       described here. The --all, --pid, and --queue options, and the possibility to specify processes by
       command name, are local extensions.

       If signal is 0, then no actual signal is sent, but error checking is still performed.

ARGUMENTS
       The list of processes to be signaled can be a mixture of names and PIDs.

       pid
           Each pid can be expressed in one of the following ways:

           n
               where n is larger than 0. The process with PID n is signaled.

           0
               All processes in the current process group are signaled.

           -1
               All processes with a PID larger than 1 are signaled.
 Manual page kill(1) line 1 (press h for help or q to quit)
```

Выводы по проделанной работе

Вывод

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.