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

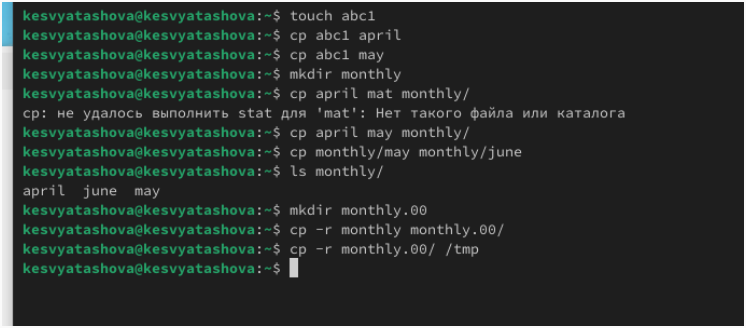


Рис. 1: Выполнение примеров

Выполнение примеров

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

Рис. 2: Выполнение примеров

Выполнение примеров

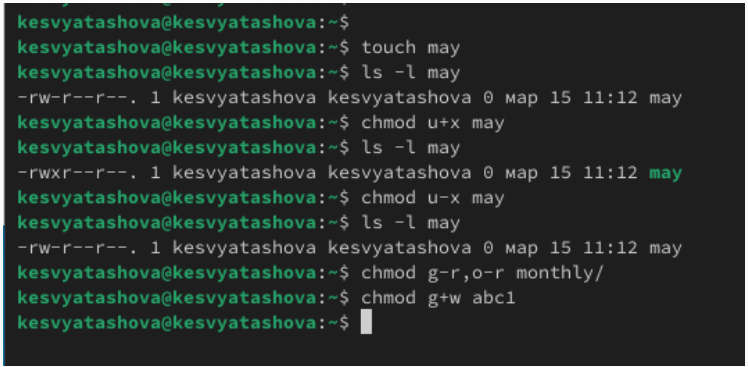


Рис. 3: Выполнение примеров

Создание директорий и копирование файлов

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

Рис. 4: Работа с каталогами

Работа с командой chmod

```
kesvyatashova@kesvyatashova:~$ mkdir australia play
kesvyatashova@kesvyatashova:~$ touch my_os feathers
kesvyatashova@kesvyatashova:~$ chmod 744 australia/
kesvyatashova@kesvyatashova:~$ chmod 711 play/
kesvyatashova@kesvyatashova:~$ chmod 544 my_os
kesvyatashova@kesvyatashova:~$ chmod 664 feathers
kesvyatashova@kesvyatashova:~$ ls -l
итого 0
-rw-rw-r--. 1 kesvyatashova kesvyatashova  0 мар 15 11:14  abc1
drwxr--r--. 1 kesvyatashova kesvyatashova  0 мар 15 11:15  australia
-rw-rw-r--. 1 kesvyatashova kesvyatashova  0 мар 15 11:15  feathers
drwxr-xr-x. 1 kesvyatashova kesvyatashova 74 фев 28 10:44  git-extended
-rw-r--r--. 1 kesvyatashova kesvyatashova  0 мар 15 11:12  may
drwx--x--x. 1 kesvyatashova kesvyatashova 24 мар 15 11:08  monthly
-r-xr--r--. 1 kesvyatashova kesvyatashova  0 мар 15 11:15  my_os
drwx--x--x. 1 kesvyatashova kesvyatashova  0 мар 15 11:15  play
drwxr-xr-x. 1 kesvyatashova kesvyatashova 14 мар 15 11:11  reports
drwxr-xr-x. 1 kesvyatashova kesvyatashova 28 мар 15 11:14  ski.plases
drwxr-xr-x. 1 kesvyatashova kesvyatashova 10 фев 28 10:21  work
drwxr-xr-x. 1 kesvyatashova kesvyatashova  0 фев 28 10:11  Видео
drwxr-xr-x. 1 kesvyatashova kesvyatashova  0 фев 28 10:11  Документы
drwxr-xr-x. 1 kesvyatashova kesvyatashova  0 фев 28 10:11  Загрузки
drwxr-xr-x. 1 kesvyatashova kesvyatashova  0 фев 28 10:11  Изображения
drwxr-xr-x. 1 kesvyatashova kesvyatashova  0 фев 28 10:11  Музыка
drwxr-xr-x. 1 kesvyatashova kesvyatashova  0 фев 28 10:11  Общедоступные
drwxr-xr-x. 1 kesvyatashova kesvyatashova  0 фев 28 10:11 'Рабочий стол'
drwxr-xr-x. 1 kesvyatashova kesvyatashova  0 фев 28 10:11  Шаблоны
kesvyatashova@kesvyatashova:~$
```

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
chrony:x:997:994:chrony system user:/var/lib/chrony:/sbin/nologin
dnsmasq:x:996:993:Dnsmasq DHCP and DNS server:/var/lib/dnsmasq:/usr/sbin/nologin
gluster:x:995:992:GlusterFS daemons:/run/gluster:/sbin/nologin
```

Рис. 6: Файл /etc/passwd

Работа с файлами и правами доступа

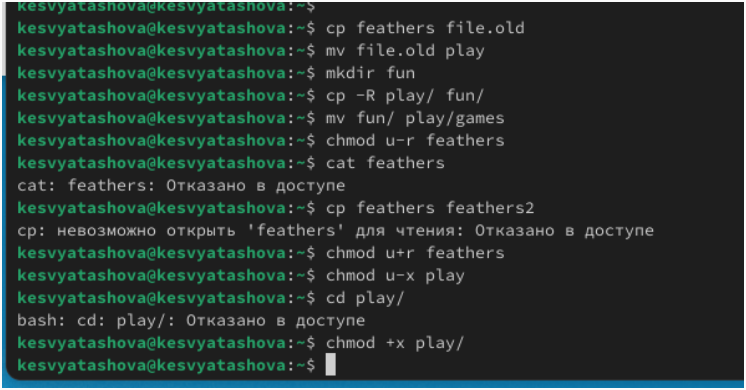
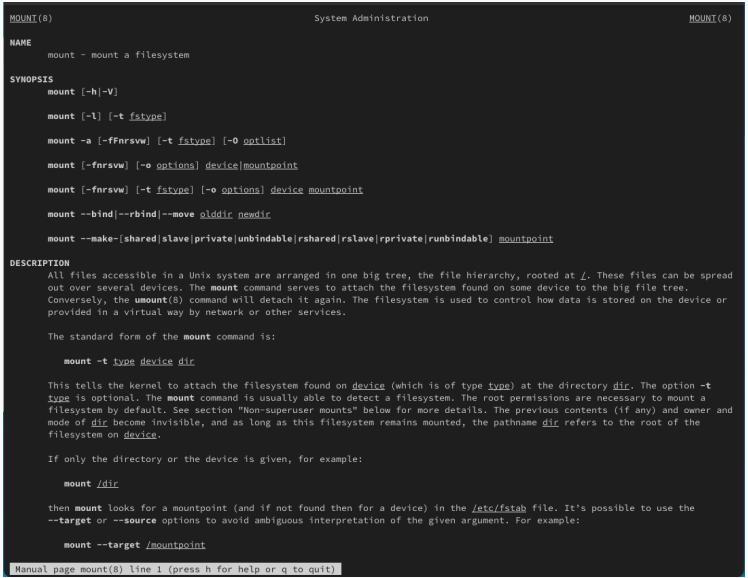


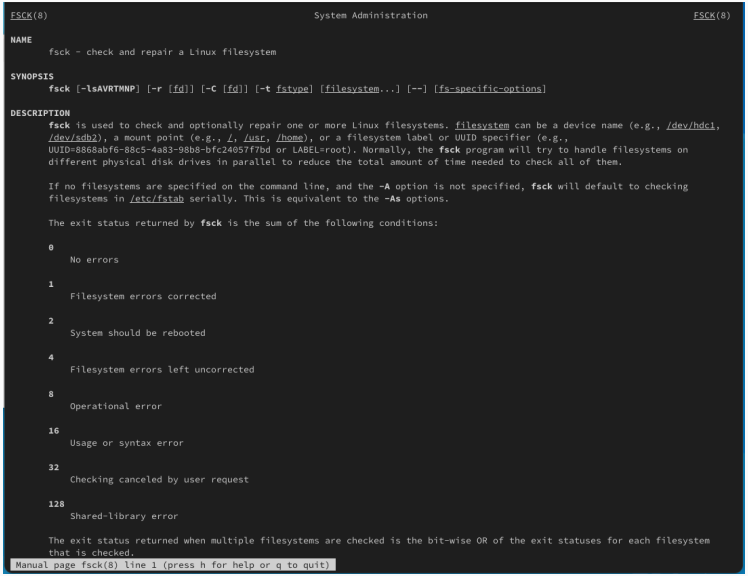
Рис. 7: Работа с файлами и правами доступа

Справка по командам



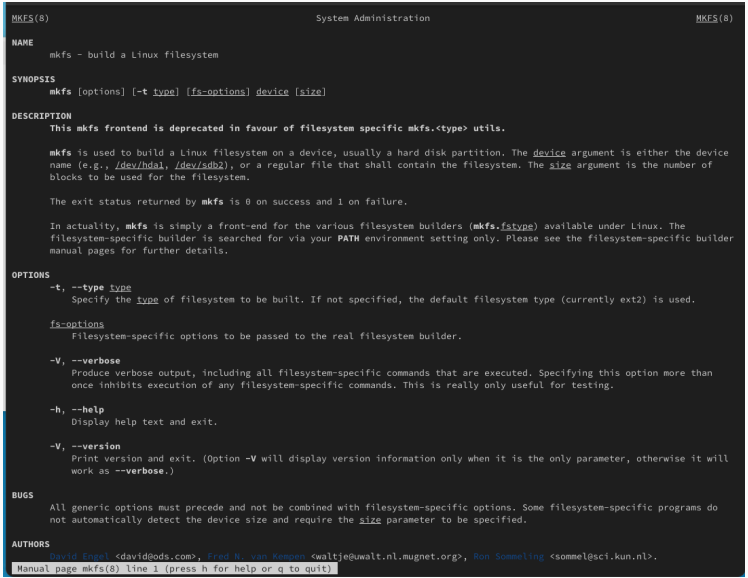
```
MOUNT(8)                        System Administration                        MOUNT(8)

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:

          mount /dir

       then mount looks for a mountpoint (and if not found then for a device) in the /etc/fstab file. It's possible to use the
       --target or --source options to avoid ambiguous interpretation of the given argument. For example:

          mount --target /mountpoint

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

Справка по командам



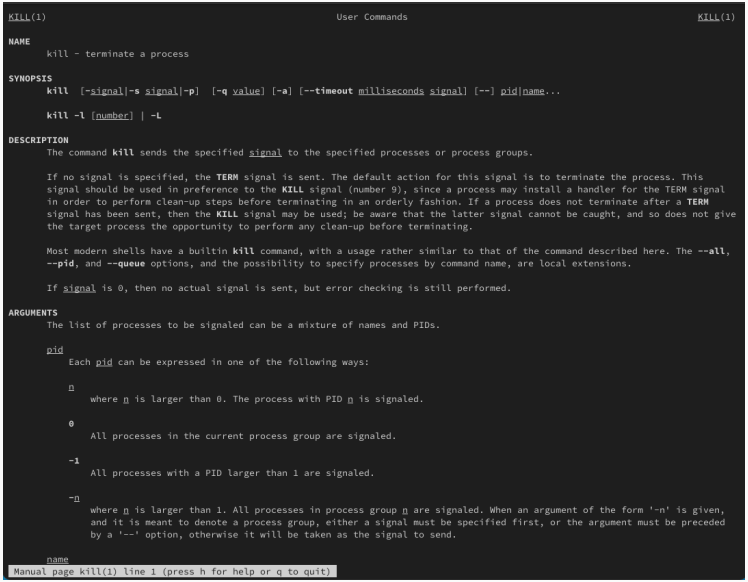
```
FSCK(8)                                System Administration                                FSCK(8)

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

       128
           Shared-library error

       The exit status returned when multiple filesystems are checked is the bit-wise OR of the exit statuses for each filesystem
       that is checked.
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.)

BUGS
       All generic options must precede and not be combined with filesystem-specific options. Some filesystem-specific programs do
       not automatically detect the device size and require the size parameter to be specified.

AUTHORS
       David Engel <david@ods.com>, Fred N. van Kempen <waltje@uwalt.nl.mugnet.org>, Ron Sommeling <sommel@sci.kun.nl>.
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.

           -n
                  Where n is larger than 1. All processes in process group n are signaled. When an argument of the form '-n' is given,
                  and it is meant to denote a process group, either a signal must be specified first, or the argument must be preceded
                  by a '--' option, otherwise it will be taken as the signal to send.

       name
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.