

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

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Цели и задачи работы

Цель лабораторной работы

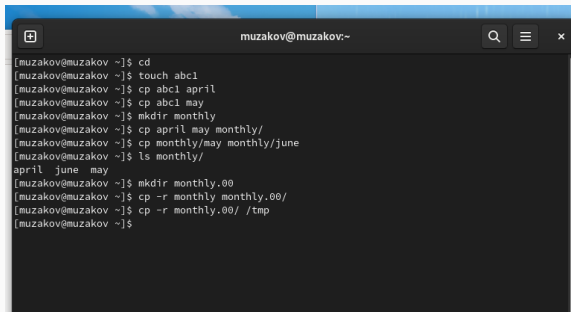
Ознакомление с файловой системой Linux, её структурой, именами и содержанием каталогов. Приобретение практических навыков по применению команд для работы с файлами и каталогами, по управлению процессами, по проверке использования диска и обслуживанию файловой системы.

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



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

Рис. 1: Выполнение примеров

Выполнение примеров

```
[muzakov@muzakov ~]$  
[muzakov@muzakov ~]$  
[muzakov@muzakov ~]$ cd  
[muzakov@muzakov ~]$ mv april july  
[muzakov@muzakov ~]$ mv july monthly.00/  
[muzakov@muzakov ~]$ ls monthly.00/  
july  monthly  
[muzakov@muzakov ~]$ mv monthly.00/ monthly.01  
[muzakov@muzakov ~]$ mkdir reports  
[muzakov@muzakov ~]$ mv monthly.01/ reports/  
[muzakov@muzakov ~]$ mv reports/monthly.01/ reports/monthly  
[muzakov@muzakov ~]$
```

Рис. 2: Выполнение примеров

Выполнение примеров

```
[muzakov@muzakov ~]$  
[muzakov@muzakov ~]$ cd  
[muzakov@muzakov ~]$ touch may  
[muzakov@muzakov ~]$ ls -l may  
-rw-r--r--. 1 muzakov muzakov 0 сен  8 11:01 may  
[muzakov@muzakov ~]$ chmod u+x may  
[muzakov@muzakov ~]$ ls -l may  
-rwxr--r--. 1 muzakov muzakov 0 сен  8 11:01 may  
[muzakov@muzakov ~]$ chmod u-x may  
[muzakov@muzakov ~]$ ls -l may  
-rw-r--r--. 1 muzakov muzakov 0 сен  8 11:01 may  
[muzakov@muzakov ~]$ cd  
[muzakov@muzakov ~]$ mkdir monthly/  
mkdir: невозможно создать каталог «monthly/»: Файл существует  
[muzakov@muzakov ~]$ chmod g-r,o-r monthly/  
[muzakov@muzakov ~]$ cd  
[muzakov@muzakov ~]$ touch abc1  
[muzakov@muzakov ~]$ chmod g+w abc1  
[muzakov@muzakov ~]$
```

Рис. 3: Выполнение примеров

Создание директорий и копирование файлов

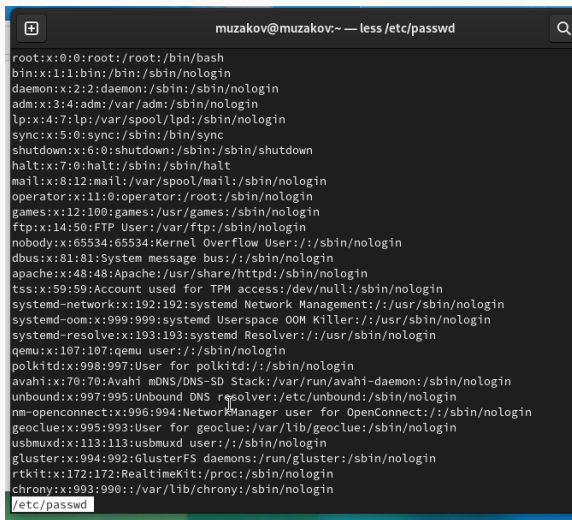
```
[muzakov@muzakov ~]$  
[muzakov@muzakov ~]$ cp /usr/include/linux/sysinfo.h ~  
[muzakov@muzakov ~]$ mv sysinfo.h equipment  
[muzakov@muzakov ~]$ mkdir ski.plases  
[muzakov@muzakov ~]$ mv equipment ski.plases/  
[muzakov@muzakov ~]$ mv ski.plases/equipment ski.plases/equiplist  
[muzakov@muzakov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

Рис. 4: Работа с каталогами

Работа с командой chmod

```
muzakov@muzakov:~  
[muzakov@muzakov ~]$ mkdir australia play  
[muzakov@muzakov ~]$ tiuch my_os feathers  
bash: tiuch: команда не найдена...  
Аналогичная команда: 'touch'  
[muzakov@muzakov ~]$ touch my_os feathers  
[muzakov@muzakov ~]$ chmod 744 australia/  
[muzakov@muzakov ~]$ chmod 711 play/  
[muzakov@muzakov ~]$ chmod 544 my_os  
[muzakov@muzakov ~]$ chmod 664 feathers  
[muzakov@muzakov ~]$ ls -l  
итого 0  
-rw-rw-r--. 1 muzakov muzakov 0 сен 8 11:05 abc1  
drwxr--r--. 1 muzakov muzakov 0 сен 8 11:07 australia  
-rw-rw-r--. 1 muzakov muzakov 0 сен 8 11:07 feathers  
-rw-r--r--. 1 muzakov muzakov 0 сен 8 11:01 may  
drwx--x--x. 1 muzakov muzakov 24 сен 8 10:58 monthly  
-r-xr--r--. 1 muzakov muzakov 0 сен 8 11:07 my_os  
drwx--x--x. 1 muzakov muzakov 0 сен 8 11:07 play  
drwxr-xr-x. 1 muzakov muzakov 14 сен 8 11:00 reports  
drwxr-xr-x. 1 muzakov muzakov 28 сен 8 11:06 ski.plases  
drwxr-xr-x. 1 muzakov muzakov 10 сен 7 21:25 work  
drwxr-xr-x. 1 muzakov muzakov 0 сен 7 21:18 Видео  
drwxr-xr-x. 1 muzakov muzakov 0 сен 7 21:18 Документы  
drwxr-xr-x. 1 muzakov muzakov 0 сен 7 21:18 Загрузки  
drwxr-xr-x. 1 muzakov muzakov 0 сен 7 21:18 Изображения  
drwxr-xr-x. 1 muzakov muzakov 0 сен 7 21:18 Музыка  
drwxr-xr-x. 1 muzakov muzakov 0 сен 7 21:18 Общедоступные  
drwxr-xr-x. 1 muzakov muzakov 0 сен 7 21:18 'Рабочий стол'  
drwxr-xr-x. 1 muzakov muzakov 0 сен 7 21:18 Шаблоны  
[muzakov@muzakov ~]$
```

Файл /etc/passwd



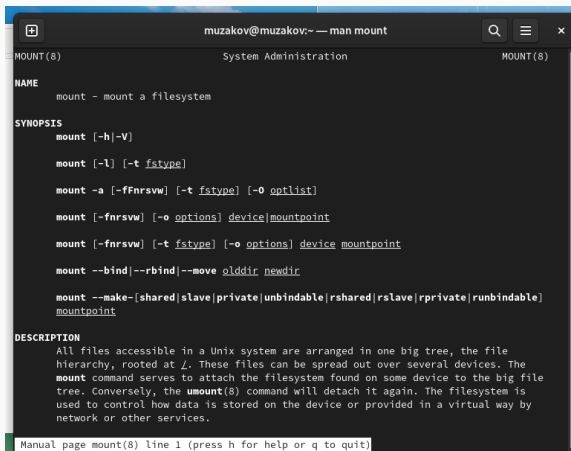
```
muzakov@muzakov:~ — less /etc/passwd
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
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
nm-openconnect:x:996:994:NetworkManager user for OpenConnect:/sbin/nologin
geoclue:x:995:993:User for geoclue:/var/lib/geoclue:/sbin/nologin
usbmuxd:x:113:113:usbmuxd user:/sbin/nologin
gluster:x:994:992:GlusterFS daemons:/run/gluster:/sbin/nologin
rtkit:x:172:172:RealtimeKit:/proc:/sbin/nologin
chrony:x:993:990::/var/lib/chrony:/sbin/nologin
/etc/passwd
```

Рис. 6: Файл /etc/passwd

Работа с файлами и правами доступа

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

Рис. 7: Работа с файлами и правами доступа



```
muzakov@muzakov:~ — man mount
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

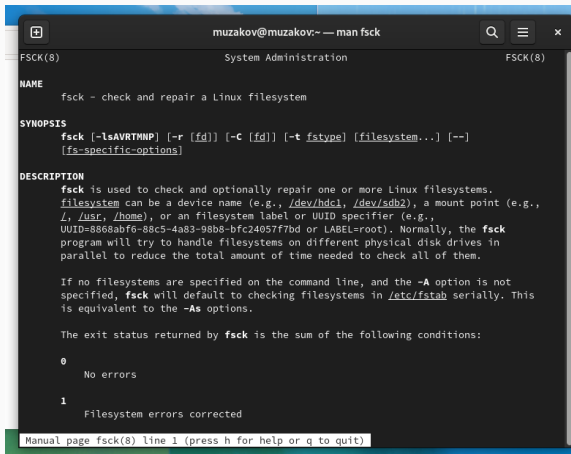
    mount --bind|--rbind|--move olddir newdir

    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.

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

Рис. 8: Команда mount



```
muzakov@muzakov:~ — 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.

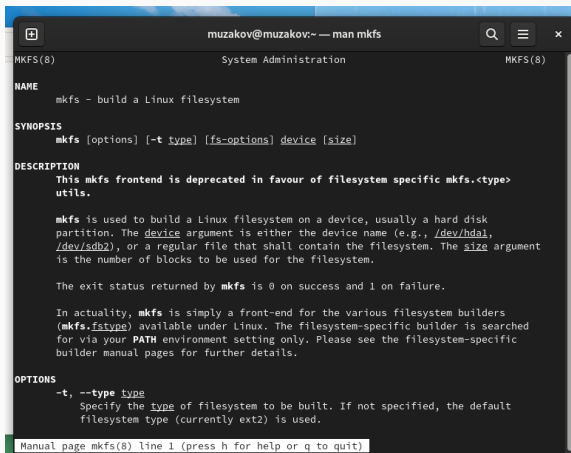
    The exit status returned by fsck is the sum of the following conditions:

    0
        No errors

    1
        Filesystem errors corrected

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

Рис. 9: Команда fsck



```
muzakov@muzakov:~ -- 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.

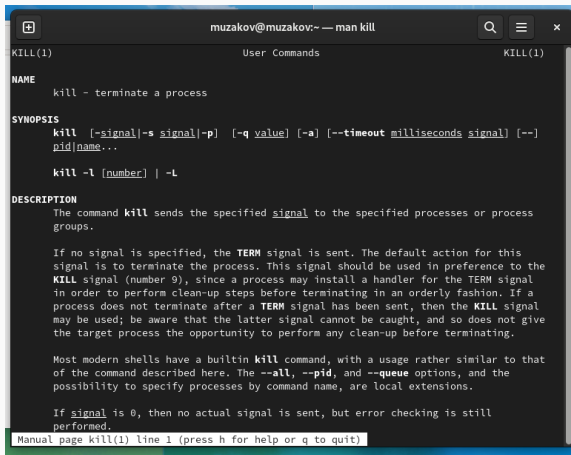
    The exit status returned by mkfs is 0 on success and 1 on failure.

    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 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.

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

Рис. 10: Команда mkfs



```
muzakov@muzakov:~ — 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 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.

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.