

# Лабораторная работа № 8

Операционные системы

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Перегудов А.В.

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Российский университет дружбы народов, Москва, Россия

# Информация

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- Перегудов Александр Вадимович
- Студент группы НКАбд-04-23
- Российский университет дружбы народов
- [1132239659@pfur.ru]
- [https://github.com/magister6239/study\\_2023-2024\\_os-intro](https://github.com/magister6239/study_2023-2024_os-intro)

# **Вводная часть**

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Поиск файлов. Перенаправление ввода-вывода. Просмотр запущенных процессов

- Умение использовать инструменты поиска файлов является ключевым навыком.
- Перенаправление ввода-вывода используется для множества задач, включая перенаправление вывода команды в файл, чтение ввода из файла вместо стандартного потока ввода и т. д. Это необходимо как для повседневных задач, так и для автоматизации и сценариев оболочки.
- Мониторинг и управление процессами - важная задача для администраторов систем и разработчиков. Знание того, как работать с процессами позволит выполнять более широкий спектр задач и облегчить работу с системой.

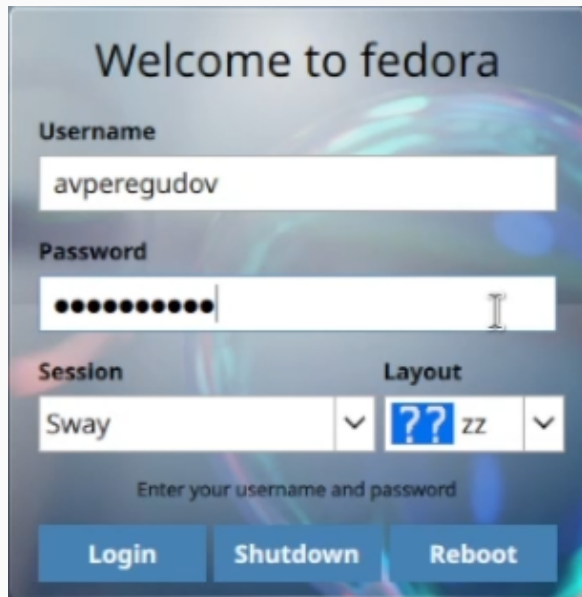
- концепция конвейера
- концепция потоков
- find
- grep
- df
- du
- ps
- kill

Получение навыков поиска файлов, управления процессами и работы с потоками ввода-вывода.



- Процессор pandoc для входного формата Markdown
- Результирующие форматы
  - pdf
  - html
- Автоматизация процесса создания: Makefile

## Вход в систему

The image shows the Fedora Linux login interface. At the top, it says "Welcome to fedora". Below that are fields for "Username" (containing "avperegudov") and "Password" (masked with dots). There are also dropdown menus for "Session" (set to "Sway") and "Layout" (set to "??" with "zz" next to it). At the bottom, there are three buttons: "Login", "Shutdown", and "Reboot".

Welcome to fedora

Username

avperegudov

Password

●●●●●●●●

Session

Sway

Layout

?? zz

Enter your username and password

Login Shutdown Reboot

# Запись в файл file.txt

```
[avperegudov@fedora ~]$ ls /etc -a > file.txt
[avperegudov@fedora ~]$ ls
Desktop  Documents  Downloads  file.txt  Music  newdir  Pictures  Public  Templates  Videos  work
[avperegudov@fedora ~]$ cat file.txt
.
..
abrt
adjtime
aliases
alsa
alternatives
anaconda
anacrontab
appstream.conf
asound.conf
at.deny
audit
authselect
avahi
bash_completion.d
bashrc
bindresvport.blacklist
binfmt.d
bluetooth
chromium
chrony.conf
cifs-utils
credstore
credstore.encrypted
cron.d
cron.daily
cron.deny
cron.hourly
cron.monthly
crontab
cron.weekly
crypto-policies
crypttab
csh.cshrc
csh.login
cups
cupshelpers
dbus-1
dconf
debuginfod
default
```

## Запись в файл file.txt

```
[avperegudov@fedora ~]$ ls -a >> file.txt
[avperegudov@fedora ~]$ cat file.txt
.
..
abrt
adjtime
aliases
alsa
alternatives
anaconda
anacrontab
appstream.conf
asound.conf
at.deny
audit
authselect
avahi
```

# Вывод файла file.txt

```
x12tpd
xml
yum.repos.d
.
..
.bash_history
.bash_logout
.bash_profile
.bashrc
.cache
.config
Desktop
Documents
Downloads
file.txt
.gitconfig
.gnupg
.local
.mozilla
Music
newdir
.pandoc
.pandoc.csl
.password-store
Pictures
Public
.ssh
Templates
.vboxclient-clipboard-tty2-control.pid
.vboxclient-draganddrop-tty2-control.pid
.vboxclient-hostversion-tty2-control.pid
.vboxclient-seamless-tty2-control.pid
Videos
work
[avperegudov@fedora ~]$
```

# Вывод всех файлов с расширением .conf

```
[avperegudov@fedora ~]$ cat file.txt | grep "\.conf$"  
appstream.conf  
asound.conf  
chrony.conf  
dnsmasq.conf  
dracut.conf  
fprintd.conf  
fuse.conf  
host.conf  
idmapd.conf  
ipsec.conf  
kdump.conf  
krb5.conf  
ld.so.conf  
libaudit.conf  
libuser.conf  
locale.conf  
logrotate.conf  
man_db.conf  
mke2fs.conf  
mttools.conf  
nfs.conf  
nfsmount.conf  
nilfs_cleaner.conf  
nsswitch.conf  
opensc.conf  
opensc-x86_64.conf  
passwdqc.conf  
request-key.conf  
resolv.conf  
rsyncd.conf  
rsyslog.conf  
sddm.conf  
sestatus.conf  
sudo.conf  
sysctl.conf  
Trolltech.conf  
updatedb.conf  
usb_modeswitch.conf  
vconsole.conf  
whois.conf  
xattr.conf  
[avperegudov@fedora ~]$
```

# Запись файлов с расширением .conf в файл conf.txt

```
[avperegudov@fedora ~]$ cat file.txt | grep "\.conf$" > conf.txt
[avperegudov@fedora ~]$ cat conf.txt
appstream.conf
asound.conf
chrony.conf
dnsmasq.conf
dracut.conf
fprintd.conf
fuse.conf
host.conf
idmapd.conf
ipsec.conf
kdump.conf
krb5.conf
ld.so.conf
libaudit.conf
libuser.conf
locale.conf
logrotate.conf
man_db.conf
mke2fs.conf
ntools.conf
nfs.conf
nfsmount.conf
nilfs_cleaner.conf
nsswitch.conf
opensc.conf
opensc-x86_64.conf
passwdqc.conf
request-key.conf
resolv.conf
rsyncd.conf
rsyslog.conf
sddm.conf
sestatus.conf
sudo.conf
sysctl.conf
Trolltech.conf
updatedb.conf
usb_modeswitch.conf
vconsole.conf
whois.conf
xattr.conf
[avperegudov@fedora ~]$
```

## Файлы на “с”

```
[avperegudov@fedora ~]$ ls ~/c*
/home/avperegudov/conf.txt
[avperegudov@fedora ~]$ ls c*
conf.txt
[avperegudov@fedora ~]$ echo c*
conf.txt
[avperegudov@fedora ~]$ ls | grep "c."
conf.txt
Documents
Pictures
[avperegudov@fedora ~]$ ls | grep "^c"
conf.txt
[avperegudov@fedora ~]$ find ~ -name "c*" | grep "/home/avperegudov/c."
find: '/home/avperegudov/work/study/2023-2024/OperationalSystems/os-intro/.git': Permission denied
find: '/home/avperegudov/work/study/2023-2024/OperationalSystems/os-intro/config': Permission denied
find: '/home/avperegudov/work/study/2023-2024/OperationalSystems/os-intro/template': Permission denied
/home/avperegudov/conf.txt
[avperegudov@fedora ~]$ sudo find ~ -name "c*" | grep "/home/avperegudov/c."
[sudo] password for avperegudov:
/home/avperegudov/conf.txt
[avperegudov@fedora ~]$
```



## Файлы на “h”

```
[avperegudov@fedora ~]$ ls /etc | grep "^h"  
host.conf  
hostname  
hosts  
[avperegudov@fedora ~]$ ls /etc | grep "^h" | less
```

```
host.conf  
hostname
```

## Запуск фонового процесса

```
[avperegudov@fedora ~]$ sudo find / -name "log*" > logfile &  
[1] 1835
```

```
[avperegudov@fedora ~]$ jobs  
[avperegudov@fedora ~]$ ls  
conf.txt  Documents  file.txt  Music      Pictures  ''$\033\033''q'  Videos  
Desktop   Downloads  logfile   newdir     Public    Templates         work  
[avperegudov@fedora ~]$ cat logfile
```

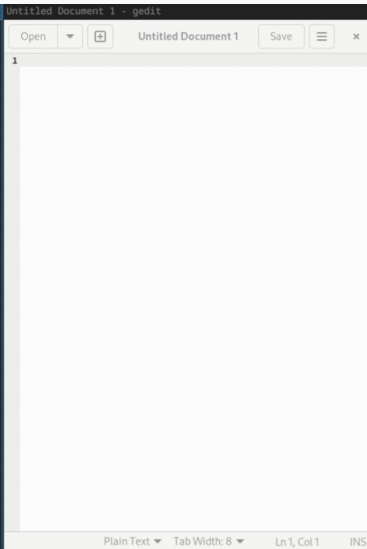
```
/usr/share/fontforge/pixmaps/logo.xbm  
/usr/share/gtksourceview-4/language-specs/logcat.lang  
/usr/share/gtksourceview-4/language-specs/logtalk.lang  
/usr/share/libgedit-gtksourceview-300/language-specs/logcat.lang  
/usr/src/kernels/6.7.6-200.fc39.x86_64/drivers/gpu/drm/logicvc  
/usr/src/kernels/6.7.6-200.fc39.x86_64/drivers/video/logo  
/usr/src/kernels/6.7.6-200.fc39.x86_64/include/asm-generic/logic_io.h  
/usr/src/kernels/6.7.6-200.fc39.x86_64/include/linux/log2.h  
/usr/src/kernels/6.7.6-200.fc39.x86_64/include/linux/logic_iomem.h  
/usr/src/kernels/6.7.6-200.fc39.x86_64/include/linux/logic_pio.h  
/usr/src/kernels/6.7.6-200.fc39.x86_64/tools/include/linux/log2.h  
/var/lib/logrotate  
/var/lib/logrotate/logrotate.status  
/var/lib/selinux/targeted/active/modules/100/logadm  
/var/lib/selinux/targeted/active/modules/100/logging  
/var/lib/selinux/targeted/active/modules/100/logrotate
```

# Удаление файла logfile

```
[avperegudov@fedora ~]$ ls
conf.txt  Desktop  Documents  file.txt  Music  Pictures  '$'\033\033''q'  Videos
[avperegudov@fedora ~]$ rm logfile
[avperegudov@fedora ~]$ ls
conf.txt  Desktop  Documents  Downloads  file.txt  Music  newdir  Pictures  Public  '$'\033\033''q'  Templates  Videos  work
[avperegudov@fedora ~]$
```

# Запуск gedit в фоновом режиме

```
foot
/usr/share/ruby/logger.rb
/usr/share/gems/specifications/default/logger-1.5.3.gemspec
/usr/share/rubygems/rubygems/resolver/molinillo/lib/molinillo/dependency_
graph/log.rb
/usr/share/tk8.6/images/logo.eps
/usr/share/tk8.6/images/logo100.gif
/usr/share/tk8.6/images/logo64.gif
/usr/share/tk8.6/images/logoLarge.gif
/usr/share/tk8.6/images/logoMed.gif
/usr/share/GraphicsMagick-1.3.40/config/log.mgk
/usr/share/fontforge/pixmaps/logo.xbm
/usr/share/gtksourceview-4/language-specs/logcat.lang
/usr/share/gtksourceview-4/language-specs/logtalk.lang
/usr/share/libgedit-gtksourceview-300/language-specs/logcat.lang
/usr/src/kernels/6.7.6-200.fc39.x86_64/drivers/gpu/drm/logicvc
/usr/src/kernels/6.7.6-200.fc39.x86_64/drivers/video/logo
/usr/src/kernels/6.7.6-200.fc39.x86_64/include/asm-generic/logic_io.h
/usr/src/kernels/6.7.6-200.fc39.x86_64/include/linux/log2.h
/usr/src/kernels/6.7.6-200.fc39.x86_64/include/linux/logic_iomem.h
/usr/src/kernels/6.7.6-200.fc39.x86_64/include/linux/logic_pio.h
/usr/src/kernels/6.7.6-200.fc39.x86_64/tools/include/linux/log2.h
/var/lib/logrotate
/var/lib/logrotate/logrotate.status
/var/lib/SELinux/targeted/active/modules/100/logadm
/var/lib/SELinux/targeted/active/modules/100/logging
/var/lib/SELinux/targeted/active/modules/100/logrotate
/var/lib/SELinux/targeted/active/modules/100/logwatch
/var/log
[avperegudov@fedora ~]$ ls
conf.txt  Desktop  Documents  file.txt  Music  Pictures  '$'\033\033''q'
Videos
Desktop  Downloads  logfile  newdir  Public  Templates
work
[avperegudov@fedora ~]$ rm logfile
[avperegudov@fedora ~]$ ls
conf.txt  Desktop  Documents  Downloads  file.txt  Music  newdir
Pictures  Public  '$'\033\033''q'  Templates  Videos  work
[avperegudov@fedora ~]$ gedit &
[1] 1843
[avperegudov@fedora ~]$ ls
conf.txt  Downloads  newdir  '$'\033\033''q'  work
Desktop  file.txt  Pictures  Templates
Documents  Music  Public  Videos
[avperegudov@fedora ~]$ jobs
[1]+  Running                  gedit &
[avperegudov@fedora ~]$
```



## Определение pid процесса gedit

```
[avperegudov@fedora ~]$ ps | grep "gedit"  
1843 pts/0    00:00:10 gedit
```

```
[avperegudov@fedora ~]$ pidof gedit  
1843  
[avperegudov@fedora ~]$
```

# Вызов справки kill

```
[avperegudov@fedora ~]$ 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,
```

```
[avperegudov@fedora ~]$ kill 1843  
[avperegudov@fedora ~]$
```

# Команда df

```
[avperegudov@fedora ~]$ man df
```

```
DE(1)                                     User Commands                                DE(1)

NAME
    df - report file system space usage

SYNOPSIS
    df [OPTION]... [FILE]...

DESCRIPTION
    This manual page documents the GNU version of df. df displays the amount of space available on the file system containing each file name argument. If no file name is given, the space available on all currently mounted file systems is shown. Space is shown in 1K blocks by default, unless the environment variable POSIXLY_CORRECT is set, in which case 512-byte blocks are used.

    If an argument is the absolute file name of a device node containing a mounted file system, df shows the space available on that file system rather than on the file system containing the device node. This version of df cannot show the space available on unmounted file systems, because on most kinds of systems doing so requires very nonportable intimate knowledge of file system structures.
```

```
[avperegudov@fedora ~]$ df
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
/dev/sda3	82221056	10807204	68242940	14%	/
devtmpfs	4096	0	4096	0%	/dev
tmpfs	1994344	344	1994000	1%	/dev/shm
efivarfs	256	25	227	10%	/sys/firmware/efi/efivars
tmpfs	797740	1136	796604	1%	/run
tmpfs	1994344	4	1994340	1%	/tmp
/dev/sda3	82221056	10807204	68242940	14%	/home
/dev/sda2	996780	245456	682512	27%	/boot
/dev/sda1	613160	19492	593668	4%	/boot/efi
work	884859900	800053292	84806608	91%	/media/sf_work



# Команда du

```
[avperegudov@fedora ~]$ man du
```

```
du(1)                                User Commands                                du(1)

NAME
    du - estimate file space usage

SYNOPSIS
    du [OPTION]... [FILE]...
    du [OPTION]... --files0-from=F

DESCRIPTION
    Summarize device usage of the set of FILES, recursively for directories.

    Mandatory arguments to long options are mandatory for short options too.

    -0, --null
        end each output line with NUL, not newline

    -a, --all
        write counts for all files, not just directories
```

```
[avperegudov@fedora ~]$ du
0      ./mozilla/extensions/{ec8030f7-c20a-464f-9b0e-13a3a9e97384}
0      ./mozilla/extensions
0      ./mozilla/plugins
0      ./mozilla/firefox/Crash Reports/events
0      ./mozilla/firefox/Crash Reports
0      ./mozilla/firefox/Pending Pings
4588   ./mozilla/firefox/eeuw805u.default-release/mini-dumps
0      ./mozilla/firefox/eeuw805u.default-release/crashes/events
0      ./mozilla/firefox/eeuw805u.default-release/crashes
0      ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome/idb/3870112724rsegmnoittet-es.files/journals
812    ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome/idb/3870112724rsegmnoittet-es.files
0      ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome/idb/3561288849sdhlie.files
0      ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome/idb/1451318868ntouromalnodyn--epcr.files
0      ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome/idb/1657114595Amcateirvti5ty.files
0      ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome/idb/2918063365plupsah.files
0      ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome/idb/2823318777ntouromalnodyn--naod.files
12020  ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome/idb
12024  ./mozilla/firefox/eeuw805u.default-release/storage/permanent/chrome
12024  ./mozilla/firefox/eeuw805u.default-release/storage/permanent
0      ./mozilla/firefox/eeuw805u.default-release/storage/temporary
16     ./mozilla/firefox/eeuw805u.default-release/storage/default/https++github.com/ls
```

# Вывод всех директорий домашнего каталога

```
[avperegudov@fedora ~]$ man find
```

```
find(1)                                General Commands Manual                                find(1)

NAME
    find - search for files in a directory hierarchy

SYNOPSIS
    find [-H] [-L] [-P] [-D debugopts] [-Olevel] [starting-point...] [expression]

DESCRIPTION
    This manual page documents the GNU version of find. GNU find searches the directory tree rooted at each given starting-point by evaluating the given expression from left to right, according to the rules of precedence (see section OPERATORS), until the outcome is known (the left hand side is false for and operations, true for or), at which point find moves on to the next file name. If no starting-point is specified, . is assumed.

    If you are using find in an environment where security is important (for example if you are using it to search directories that are writable by other users), you should read the 'Security Considerations' chapter of the findutils documentation, which is called Finding Files and comes with findutils. That document also includes a lot more detail and discussion than this manual page, so you may find it a more useful source of information.
```

```
[avperegudov@fedora ~]$ find -type d -maxdepth 1
find: warning: you have specified the global option -maxdepth after the argument -type, but global options are not positional, i.e., -maxdepth affects tests specified before it as well as those specified after it. Please specify global options before other arguments.
```

```
./mozilla
./cache
./Desktop
./Downloads
./Templates
./Public
./Documents
./Music
./Pictures
./Videos
./config
./local
./pandoc
./gnupg
./work
./ssh
./password-store
./newdir
[avperegudov@fedora ~]$
```