

Домашнее задание к занятию "3.3 Операционные системы лекция 1"

1. Вызовем команду **strace** на **/bin/bash -c 'cd /tmp'**

вывод с терминала:

hachiko@hachik-O:~\$ strace /bin/bash -c 'cd /tmp'

найдем системных вызовов который относится именно к **cd** это **chdir("/tmp")**

скриншот с терминала

```
ioctl(2, TIOCGPGRP, [4088]) = 0
rt_sigaction(SIGCHLD, {sa_handler=0x559bff55cd40, sa_
2fa40}, 8) = 0
prlimit64(0, RLIMIT_NPROC, NULL, {rlim_cur=31483, rli
rt_sigprocmask(SIG_BLOCK, NULL, [], 8) = 0
getpeername(0, 0x7ffe47581c80, [16]) = -1 ENOTSOCK
rt_sigprocmask(SIG_BLOCK, NULL, [], 8) = 0
newfstatat(AT_FDCWD, "/tmp", {st_mode=S_IFDIR|S_ISVTX
chdir("/tmp") = 0
rt_sigprocmask(SIG_BLOCK, [CHLD], [], 8) = 0
rt_sigprocmask(SIG_SETMASK, [], NULL, 8) = 0
exit_group(0) = ?
+++ exited with 0 +++
```

2. Вывод с терминала:

hachiko@hachik-O:~\$ file /dev/tty

/dev/tty: character special (5/0)

hachiko@hachik-O:~\$ file /dev/sda

/dev/sda: block special (8/0)

hachiko@hachik-O:~\$ file /bin/bash

/bin/bash: ELF 64-bit LSB shared object, x86-64, version 1 (SYSV), dynamically
linked, interpreter /lib64/ld-linux-x86-64.so.2,
BuildID[sha1]=2a9f157890930ced4c3ad0e74fc1b1b84aad71e6, for GNU/Linux 3.2.0,
stripped

Запустим **strace** на **file /dev/tty**

Вывод с терминала:

hachiko@hachik-O:~\$ strace file /dev/tty 2>&1 | grep open

openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3

openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libmagic.so.1",

O_RDONLY|O_CLOEXEC) = 3

openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3

openat(AT_FDCWD, "/lib/x86_64-linux-gnu/liblzma.so.5", O_RDONLY|O_CLOEXEC)

= 3

```

openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libbz2.so.1.0",
O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libz.so.1", O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libpthread.so.0",
O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/usr/lib/locale/locale-archive", O_RDONLY|O_CLOEXEC) = 3
openat(AT_FDCWD, "/etc/magic.mgc", O_RDONLY) = -1 ENOENT (Нет такого
файла или каталога)
openat(AT_FDCWD, "/etc/magic", O_RDONLY) = 3
openat(AT_FDCWD, "/usr/share/misc/magic.mgc", O_RDONLY) = 3
openat(AT_FDCWD, "/usr/lib/x86_64-linux-gnu/gconv/gconv-modules.cache",
O_RDONLY) = 3
hachiko@hachik-O:~$ file /usr/share/misc/magic.mgc
/usr/share/misc/magic.mgc: symbolic link to ../../lib/file/magic.mgc
hachiko@hachik-O:~$ file ../../lib/file/magic.mgc
../../lib/file/magic.mgc: magic binary file for file(1) cmd (version 14) (little endian)

```

файл расположен: **/usr/share/misc/magic.mgc** и **/usr/lib/file/magic.mgc**

3. Запустим пинг в запись в файл

Вывод с терминала:

```

root@vagrant:/home/vagrant# ping 8.8.8.8 > log_ping.txt
^Z
[1]+  Stopped                  ping 8.8.8.8 > log_ping.txt
root@vagrant:/home/vagrant# bg
[1]+ ping 8.8.8.8 > log_ping.txt &

```

Запустим **root@vagrant:/home/vagrant# ps aux**

Скриншот

The screenshot shows a terminal window with the following content:

```

systemd+ 613 0.0 1.2 23860 12100 ? Ss 20:13 0:00 /lib/systemd/systemd-resolved
root 628 0.0 0.9 239288 9468 ? Ssl 20:13 0:00 /usr/lib/accounts-service/accounts-daemon
message+ 629 0.0 0.4 7894 4668 ? Ss 20:13 0:00 /usr/bin/dmcc-dmcc --system --address-systemd: --nofork --nopidfile --systemd-activation --syslog-only
root 633 0.0 0.3 81824 3820 ? Ssl 20:13 0:00 /usr/sbin/irqbalance --foreground
root 634 0.0 1.8 29656 18452 ? Ss 20:13 0:00 /usr/bin/python3 /usr/bin/networkd-dispatcher --run-startup-triggers
root 637 0.0 0.8 236308 8864 ? Ssl 20:13 0:00 /usr/lib/policykit-1/polkitd --no-debug
syslog 638 0.0 0.4 224344 4880 ? Ssl 20:13 0:00 /usr/sbin/rsyslogd -n -iNONE
root 640 0.0 3.7 87408 37252 ? Ssl 20:13 0:02 /usr/lib/napd/napd
root 642 0.0 0.7 16644 7844 ? Ss 20:13 0:00 /lib/systemd/systemd-logind
root 646 0.0 1.3 394876 13580 ? Ssl 20:13 0:00 /usr/lib/udisks2/udisksd
root 652 0.0 0.2 6812 2892 ? Ss 20:13 0:00 /usr/sbin/cron -f
root 656 0.0 0.0 0 0 ? I 20:13 0:00 [kworker/0-4-events]
daemon 662 0.0 0.2 3792 2252 ? Ss 20:13 0:00 /usr/sbin/atd -f
root 674 0.0 0.0 0 0 ? I 20:13 0:00 [kworker/0-5-events]
root 678 0.0 0.7 12172 7436 ? Ss 20:13 0:00 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
root 685 0.0 0.1 5828 1828 tty1 Ss+ 20:13 0:00 /sbin/agetty -o -p -- --nolclear tty1 linux
root 697 0.0 1.1 314456 11852 ? Ssl 20:13 0:00 /usr/sbin/ModemManager
root 936 0.0 0.2 292816 2900 ? Sl 20:13 0:00 /usr/sbin/VBoxService --pidfile /var/run/vboxadd-service.sh
root 1261 0.0 0.9 13792 9836 ? Ss 20:15 0:00 sshd: vagrant [priv]
vagrant 1274 0.0 0.9 18364 9080 ? Ss 20:15 0:00 /lib/systemd/systemd --user
vagrant 1275 0.0 0.3 103240 3376 ? S 20:15 0:00 (sd-pam)
vagrant 1303 0.0 0.6 13952 6324 ? S 20:15 0:00 sshd: vagrant@pts/0
vagrant 1304 0.0 0.4 7236 4168 pts/0 Ss 20:15 0:00 -bash
root 1313 0.0 0.4 9264 4652 pts/0 S 20:16 0:00 sudo su
root 1315 0.0 0.4 8372 4232 pts/0 S 20:16 0:00 su
root 1316 0.0 0.4 7236 4060 pts/0 S 20:16 0:00 bash
root 1339 0.0 0.0 7092 924 pts/0 D 20:17 0:00 ping 8.8.8.8
root 1341 0.0 0.3 8888 3320 pts/0 R+ 20:18 0:00 ps aux
root@vagrant:/home/vagrant# rm log_ping.txt
root@vagrant:/home/vagrant# lsof -p 1339
COMMAND PID USER FD TYPE DEVICE SIZE/OFF NODE NAME
ping 1339 root cwd DIR 253,0 4096 1314700 /home/vagrant
ping 1339 root rtd DIR 253,0 4096 2 /
ping 1339 root txt REG 253,0 72776 1058875 /usr/bin/ping
ping 1339 root mem REG 253,0 3835952 1048854 /usr/lib/locale/locale-archive
ping 1339 root mem REG 253,0 137284 1048865 /usr/lib/x86_64-linux-gnu/libgpg-error.so.0.28.0
ping 1339 root mem REG 253,0 2029592 1048470 /usr/lib/x86_64-linux-gnu/libc-2.31.so
ping 1339 root mem REG 253,0 101352 1050126 /usr/lib/x86_64-linux-gnu/libresolv-2.31.so
ping 1339 root mem REG 253,0 1168056 1054855 /usr/lib/x86_64-linux-gnu/libcrypt.so.2.0.2.5
ping 1339 root mem REG 253,0 31120 1054811 /usr/lib/x86_64-linux-gnu/libcap.so.2.32
ping 1339 root mem REG 253,0 191584 1049280 /usr/lib/x86_64-linux-gnu/libd-2.31.so
ping 1339 root bu CHR 136,0 0 3 /dev/pts/0
ping 1339 root lw REG 253,0 6881 1311812 /home/vagrant/log_ping.txt (deleted)
ping 1339 root 2u CHR 136,0 0 3 /dev/pts/0
ping 1339 root 3u icmp 0 28771 00000000:0001->00000000:0000
ping 1339 root 4u sock 0,9 0 28772 protocol: PINGv6
root@vagrant:/home/vagrant#

```

Удалим файл log_ping.txt и запустим команду lsof - p 1339 (PID процесса ping)
Командой echo 'ping' > /proc/1339/fd/4 перенаправляем вывод и обнуляем удаленный файл.

СКРИНШОТ

```
root@vagrant:~# ps aux
root@vagrant:~# rm log_ping.txt
root@vagrant:~# lsof -p 1339
COMMAND  PID USER  FD   TYPE DEVICE SIZE/OFF  NODE NAME
ping     1339 root    cwd   DIR  253,0    4096 1314700 /home/vagrant
ping     1339 root    rtd   DIR  253,0    4096      2 /
ping     1339 root    txt   REG  253,0   72776 1050875 /usr/bin/ping
ping     1339 root    mem   REG  253,0 3035952 1048854 /usr/lib/locale/locale-archive
ping     1339 root    mem   REG  253,0 137584 1054865 /usr/lib/x86_64-linux-gnu/libgpg-error.so.0.28.0
ping     1339 root    mem   REG  253,0 2029592 1049479 /usr/lib/x86_64-linux-gnu/libc-2.31.so
ping     1339 root    mem   REG  253,0 101352 1050126 /usr/lib/x86_64-linux-gnu/libresolv-2.31.so
ping     1339 root    mem   REG  253,0 1168056 1054855 /usr/lib/x86_64-linux-gnu/libgcrypt.so.20.2.5
ping     1339 root    mem   REG  253,0 31120 1054811 /usr/lib/x86_64-linux-gnu/libcap.so.2.32
ping     1339 root    mem   REG  253,0 191504 1049280 /usr/lib/x86_64-linux-gnu/ld-2.31.so
ping     1339 root    0u    CHR 136,0      0t0      3 /dev/pts/0
ping     1339 root    1w    REG  253,0   6881 1311812 /home/vagrant/log_ping.txt (deleted)
ping     1339 root    2u    CHR 136,0      0t0      3 /dev/pts/0
ping     1339 root    3u    icmp  0t0      28771 00000000:0001->00000000:0000
ping     1339 root    4u    sock  0,9       0t0      28772 protocol: PINGv6
root@vagrant:~# echo 'ping' > /proc/1339/fd/4
```

4. Создадим зомби процесс, делал по инструкции

<https://stackoverflow.com/questions/25172425/create-zombie-process>

скриншот:

```
htop

16.0s Tasks: 155, 670 thr, 87 kthr, 1 running
1f [ ] Load average: 0.34 0.73 1.10
Mem[ ] 2.03G/7.71G Uptime: 05:16:13
Swp[ ] 0K/0K

PID USER   PRI NI  VIRT   RES   SHR  S  CPU% MEM%   TIME Command
11655 alex    20  0 11256 1408 1036 S  0.0 1.9 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11658 alex    20  0 11290 1408 1036 S  0.0 2.0 0:00.01 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11840 alex    20  0 11290 1728 1096 S  0.0 2.2 0:00.04 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11865 alex    20  0 11490 3258 1140 S  0.0 4.1 0:00.19 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11866 alex    20  0 11490 3258 1140 S  0.0 4.1 0:00.01 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11867 alex    20  0 11490 3258 1140 S  0.0 4.1 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11884 alex    20  0 11490 3258 1140 S  0.0 4.1 0:00.01 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11885 alex    20  0 11490 3258 1140 S  0.0 4.1 0:00.16 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11886 alex    20  0 11490 3258 1140 S  0.0 4.1 0:00.01 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11906 alex    20  0 11256 65748 46536 S  0.0 0.8 0:00.05 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11907 alex    20  0 11256 65748 46536 S  0.0 0.8 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11909 alex    20  0 11256 65748 46536 S  0.0 0.8 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11911 alex    20  0 11256 65748 46536 S  0.0 0.8 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11912 alex    20  0 11256 65748 46536 S  0.0 0.8 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11913 alex    20  0 11256 65748 46536 S  0.0 0.8 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11914 alex    20  0 11256 65748 46536 S  0.0 0.8 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11915 alex    20  0 11256 65748 46536 S  0.0 0.8 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11916 alex    30 10 11256 65748 46536 S  0.0 0.8 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
11983 alex    20  0 11256 1530 1308 S  0.0 2.4 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
12557 alex    20  0  0  0  0  0.0 0.0 0:00.00 /usr/bin/nc -l -p 4444
12103 alex    20  0 33.36 1508 1240 S  0.0 2.0 0:00.15 /usr/lib/chromium/chromium --type=utility --utility-sub-type=network mojom NetworkService --lang=ru --service-sandbox-type=none --enable-crashpad
13601 alex    20  0 33.66 3410 1970 S  0.0 4.3 0:00.01 /usr/lib/chromium/chromium --enable-crashpad
13604 alex    20  0 11256 2858 1136 S  0.0 2.6 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
13652 alex    20  0 11256 3108 1136 S  0.0 4.0 0:00.01 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
13723 alex    20  0 33.66 3410 1970 S  0.0 4.3 0:00.02 /usr/lib/chromium/chromium --enable-crashpad
13860 alex    20  0 11256 1508 1140 S  0.0 2.0 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
13869 alex    20  0 17744 14028 4776 S  0.0 0.2 0:00.50 zsh
13875 alex    20  0 10552 4444 2084 S  0.0 0.1 0:00.00 zsh
13889 alex    20  0 10868 10880 1580 S  0.0 0.1 0:00.00 zsh
13890 alex    20  0 10552 4496  0 S  0.0 0.1 0:00.00 zsh
13892 alex    20  0 39428 2052 1860 S  0.0 0.0 0:00.00 /usr/share/zsh-theme/powerlevel10k/gitstatus/usrbin/gitstatusd -G v1.5.3 -s -1 -u -1 -d -1 -c -1 -m -1 -v FATAL -t 4
13893 alex    20  0 39428 2052 1860 S  0.0 0.0 0:00.00 /usr/share/zsh-theme/powerlevel10k/gitstatus/usrbin/gitstatusd -G v1.5.3 -s -1 -u -1 -d -1 -c -1 -m -1 -v FATAL -t 4
13894 alex    20  0 39428 2052 1860 S  0.0 0.0 0:00.00 /usr/share/zsh-theme/powerlevel10k/gitstatus/usrbin/gitstatusd -G v1.5.3 -s -1 -u -1 -d -1 -c -1 -m -1 -v FATAL -t 4
13895 alex    20  0 39428 2052 1860 S  0.0 0.0 0:00.00 /usr/share/zsh-theme/powerlevel10k/gitstatus/usrbin/gitstatusd -G v1.5.3 -s -1 -u -1 -d -1 -c -1 -m -1 -v FATAL -t 4
13896 alex    20  0 39428 2052 1860 S  0.0 0.0 0:00.00 /usr/share/zsh-theme/powerlevel10k/gitstatus/usrbin/gitstatusd -G v1.5.3 -s -1 -u -1 -d -1 -c -1 -m -1 -v FATAL -t 4
13910 alex    20  0 11256 3108 1136 S  0.0 4.0 0:00.00 /usr/lib/chromium/chromium --type=renderer --enable-crashpad --crashpad-handler-pid=2189 --enable-crash-reporter=Arch Linux --display-capture-p
13912 alex    20  0 33.66 1278 1136 S  0.0 1.6 0:00.00 /usr/lib/chromium/chromium --type=utility --utility-sub-type=audio mojom AudioService --lang=ru --service-sandbox-type=none --enable-crashpad
```

Зомби-процессы освобождает все свои ресурсы, но остается запись в таблице процессов

5. Скриншот с терминала с выводом команды

```

root@vagrant: /home/vagrant
root@vagrant: /home/vagrant# dpkg -l | grep sbin/opensnoop
root@vagrant: /home/vagrant# opensnoop -bpfcc
PID      COMM                FD ERR PATH
365      systemd-udev        14  0 /sys/fs/cgroup/unified/system.slice/systemd-udev.service/cgroup_procs
365      systemd-udev        14  0 /sys/fs/cgroup/unified/system.slice/systemd-udev.service/cgroup_threads
936      vminfo              4  0 /var/run/utmp
629      dbus-daemon         -1  2 /usr/local/share/dbus-1/system-services
629      dbus-daemon         19  0 /usr/share/dbus-1/system-services
629      dbus-daemon         -1  2 /lib/dbus-1/system-services
629      dbus-daemon         19  0 /var/lib/snapd/dbus-1/system-services/
936      vminfo              4  0 /var/run/utmp
629      dbus-daemon         -1  2 /usr/local/share/dbus-1/system-services
629      dbus-daemon         19  0 /usr/share/dbus-1/system-services
629      dbus-daemon         -1  2 /lib/dbus-1/system-services
629      dbus-daemon         19  0 /var/lib/snapd/dbus-1/system-services/
633      irqbalance          6  0 /proc/interrupts
633      irqbalance          6  0 /proc/stat
633      irqbalance          6  0 /proc/irq/20/smp_affinity
633      irqbalance          6  0 /proc/irq/8/smp_affinity
633      irqbalance          6  0 /proc/irq/1/smp_affinity
633      irqbalance          6  0 /proc/irq/4/smp_affinity
633      irqbalance          6  0 /proc/irq/12/smp_affinity
633      irqbalance          6  0 /proc/irq/14/smp_affinity
633      irqbalance          6  0 /proc/irq/15/smp_affinity
936      vminfo              4  0 /var/run/utmp
629      dbus-daemon         -1  2 /usr/local/share/dbus-1/system-services
629      dbus-daemon         19  0 /usr/share/dbus-1/system-services
629      dbus-daemon         -1  2 /lib/dbus-1/system-services
629      dbus-daemon         19  0 /var/lib/snapd/dbus-1/system-services/
936      vminfo              4  0 /var/run/utmp
629      dbus-daemon         -1  2 /usr/local/share/dbus-1/system-services
629      dbus-daemon         19  0 /usr/share/dbus-1/system-services
629      dbus-daemon         -1  2 /lib/dbus-1/system-services
629      dbus-daemon         19  0 /var/lib/snapd/dbus-1/system-services/
633      irqbalance          6  0 /proc/interrupts
633      irqbalance          6  0 /proc/stat
633      irqbalance          6  0 /proc/irq/20/smp_affinity
633      irqbalance          6  0 /proc/irq/8/smp_affinity
633      irqbalance          6  0 /proc/irq/1/smp_affinity
633      irqbalance          6  0 /proc/irq/4/smp_affinity
633      irqbalance          6  0 /proc/irq/8/smp_affinity
633      irqbalance          6  0 /proc/irq/12/smp_affinity
633      irqbalance          6  0 /proc/irq/14/smp_affinity
633      irqbalance          6  0 /proc/irq/15/smp_affinity
936      vminfo              4  0 /var/run/utmp
629      dbus-daemon         -1  2 /usr/local/share/dbus-1/system-services
629      dbus-daemon         19  0 /usr/share/dbus-1/system-services

```

6. СИСТЕМНЫЙ ВЫЗОВ `uname()`

скриншот тапа строка `/proc/sys/kernel/{ostype, hostname, osrelease, version, domainname}`

```
man 2 uname
char domainname[]; /* NIS or YP domain name */
#endif
};

The length of the arrays in a struct utsname is unspecified (see NOTES); the fields are terminated by a null byte ('\0').

RETURN VALUE
On success, zero is returned. On error, -1 is returned, and errno is set to indicate the error.

ERRORS
EFAULT buf is not valid.

CONFORMING TO
POSIX.1-2001, POSIX.1-2008, SVr4. There is no uname() call in 4.3BSD.

The domainname member (the NIS or YP domain name) is a GNU extension.

NOTES
This is a system call, and the operating system presumably knows its name, release, and version. It also knows what hardware it runs on. So, four of the fields of the struct are meaningful. On the other hand, the field nodename is meaningless: it gives the name of the present machine in some undefined network, but typically machines are in more than one network and have several names. Moreover, the kernel has no way of knowing about such things, so it has to be told what to answer here. The same holds for the additional domainname field.

To this end, Linux uses the system calls sethostname(2) and setdomainname(2). Note that there is no standard that says that the hostname set by sethostname(2) is the same string as the nodename field of the struct returned by uname() (indeed, some systems allow a 256-byte hostname and an 8-byte nodename), but this is true on Linux. The same holds for setdomainname(2) and the domainname field.

The length of the fields in the struct varies. Some operating systems or libraries use a hardcoded 9 or 33 or 65 or 257. Other systems use SYS_NMLN or _SYS_NMLN or UTSLEN or _UTSNAME_LENGTH. Clearly, it is a bad idea to use any of these constants; just use sizeof(...). Often 257 is chosen in order to have room for an Internet hostname.

Part of the utsname information is also accessible via /proc/sys/kernel/bstype, hostname, osrelease, version, domainname.

C library/kernel differences
Over time, increases in the size of the utsname structure have led to three successive versions of uname(): sys_elduname() (slot __NR_elduname), sys_uname() (slot __NR_uname), and sys_newuname() (slot __NR_uname). The first one used length 9 for all fields; the second used 65; the third also uses 65 but adds the domainname field. The glibc uname() wrapper function hides these details from applications, invoking the most recent version of the system call provided by the kernel.

SEE ALSO
uname(1), getdomainname(2), gethostname(2), uts_namespaces(7)

COLLAPSED
This page is part of release 5.13 of the Linux man-pages project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at https://www.kernel.org/doc/man-pages/.

Linux 2021-03-22 UNAME(2)
```

7. ; - позволяет запускать несколько команд за один раз, и выполнение команды происходит последовательно.

&& - оператор будет выполнять вторую команду только в том случае, если первая команда выполнена успешно.

Использовать **set -e** - не имеет смысла, т.к. при ошибке выполнение команд прекратиться.

8. Разберем опции **set -euox pipefail**:

- e** - прекращает выполнение скрипта если команда завершилась ошибкой, выводит в stderr строку с ошибкой
 - u** - прекращает выполнение скрипта, если встретилась несуществующая переменная
 - x** - выводит выполняемые команды в stdout перед выполнением
 - o pipefail** - прекращает выполнение скрипта, даже если одна из частей пайпа завершилась ошибкой
- При запуске скрипт получается безопасным, происходит автоматическая обработка ошибок.

9. Вывод с терминала:

```
hachiko@hachik-O:~$ ps -o stat  
STAT  
Ss  
R+
```

Ss - неактивные процессы

R+ - выполняющиеся в группе приоритетных

дополнительные к заглавной букве - это дополнительные значения состояния процесса:

< - высокий приоритет

N - низкий приоритет

L - имеет страницы, заблокированные в памяти

s - является лидером сеанса

I - является многопоточным

+ - находится в группе приоритетных процессов