```
yuliachar@Virtual-linux:~$ mkdir newroot
yuliachar@Virtual-linux:~$ sudo chroot newroot/ /bin/bash
[sudo] пароль для yuliachar:
chroot: failed to run command '/bin/bash': No such file or directory
yuliachar@Virtual-linux:~$ mkdir newroot/bin
yuliachar@Virtual-linux:~$ cp /bin/bash newroot/bin/bash
yuliachar@Virtual-linux:~$ ldd /bin/bash
        linux-vdso.so.1 (0x00007ffd615ee000)
        libtinfo.so.6 => /lib/x86_64-linux-gnu/libtinfo.so.6 (0x00007f0e1657f000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f0e16200000)
        /lib64/ld-linux-x86-64.so.2 (0x00007f0e16722000)
yuliachar@Virtual-linux:~$ mkdir newroot/lib
yuliachar@Virtual-linux:~$ mkdir newroot/lib64
yuliachar@Virtual-linux:~$ cp /lib/x86_64-linux-gnu/libtinfo.so.6 newroot/lib/
yuliachar@Virtual-linux:~$ cp /lib/x86_64-linux-gnu/libc.so.6 newroot/lib/
yuliachar@Virtual-linux:~$ cp /lib64/ld-linux-x86-64.so.2 newroot/lib64/
yuliachar@Virtual-linux:~$ sudo chroot newroot/ /bin/bash
bash-5.1#
```

```
drwxrwsrwx 2 testuser    www-data    4096 апр  6 22:36 test3
lrwxrwxrwx 1 yuliachar yuliachar       5 апр  2 22:51 test_ln_dir -> test3
-rwxrwxr-x 1 yuliachar yuliachar     232 апр 23 22:40 testscript
-rw-rw-r-- 1 yuliachar yuliachar      17 апр 10 23:42 test.txt
-rw-rw-r-- 1 yuliachar yuliachar       0 апр 11 00:00 test.txt.bak
-rwxrwxr-x 1 yuliachar yuliachar      78 апр 23 23:36 user_com
-rwxrwxr-x 1 yuliachar yuliachar      72 апр 24 21:12 while_100
drwxr-xr-x 2 yuliachar yuliachar    4096 мар 28 21:17 Видео
drwxr-xr-x 2 yuliachar yuliachar    4096 мар 28 21:17 Документы
drwxr-xr-x 2 yuliachar yuliachar    4096 мар 28 21:17 Загрузки
drwxr-xr-x 2 yuliachar yuliachar    4096 мар 28 21:17 Изображения
drwxr-xr-x 2 yuliachar yuliachar    4096 мар 28 21:17 Музыка
drwxr-xr-x 2 yuliachar yuliachar    4096 мар 28 21:17 Общедоступные
drwxr-xr-x 2 yuliachar yuliachar    4096 мар 30 21:26 'Рабочий стол'
drwxr-xr-x 2 yuliachar yuliachar    4096 мар 28 21:17 Шаблоны
yuliachar@Virtual-linux:~$ sudo chroot newroot/ /bin/bash
bash-5.1# ls -l
bash: ls: command not found
bash-5.1# exit
exit
yuliachar@Virtual-linux:~$ whereis ls
ls: /usr/bin/ls /usr/share/man/man1/ls.1.gz
yuliachar@Virtual-linux:~$ mkdir newroot/usr
yuliachar@Virtual-linux:~$ mkdir newroot/usr/bin
yuliachar@Virtual-linux:~$ cp /usr/bin/ls newroot/usr/bin
yuliachar@Virtual-linux:~$ ldd newroot/usr/bin
ldd: newroot/usr/bin: не обычный файл
yuliachar@Virtual-linux:~$ ldd /usr/bin/ls
        linux-vdso.so.1 (0x00007fffa7bac000)
        libselinux.so.1 => /lib/x86_64-linux-gnu/libselinux.so.1 (0x00007f4af61b3000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f4af5e00000)
        libpcre2-8.so.0 => /lib/x86_64-linux-gnu/libpcre2-8.so.0 (0x00007f4af611c000)
        /lib64/ld-linux-x86-64.so.2 (0x00007f4af6213000)
yuliachar@Virtual-linux:~$ cp /lib/x86_64-linux-gnu/libselinux.so.1 newroot/lib/
yuliachar@Virtual-linux:~$ cp /lib/x86_64-linux-gnu/libc.so.6 newroot/lib/
yuliachar@Virtual-linux:~$ cp /lib/x86_64-linux-gnu/libpcre2-8.so.0 newroot/lib/
yuliachar@Virtual-linux:~$ cp /lib64/ld-linux-x86-64.so.2 newroot/lib64/
yuliachar@Virtual-linux:~$ sudo chroot newroot/ /bin/bash
bash-5.1# ls -l
total 16
drwxrwxr-x 2 1000 1000 4096 Jul 16 12:57 bin
drwxrwxr-x 2 1000 1000 4096 Jul 16 13:09 lib
drwxrwxr-x 2 1000 1000 4096 Jul 16 13:01 lib64
drwxrwxr-x 3 1000 1000 4096 Jul 16 13:06 usr
bash-5.1#
```

```
9: vethad7a738@if8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br-9b108ca334d7 state UP group default
    link/ether 02:72:74:49:f9:5c brd ff:ff:ff:ff:ff:ff link-netnsid 0
    inet6 fe80::72:74ff:fe49:f95c/64 scope link
       valid_lft forever preferred_lft forever
11: vethae56b82@if10: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br-9b108ca334d7 state UP group default
    link/ether e2:5c:f9:68:99:14 brd ff:ff:ff:ff:ff:ff link-netnsid 1
    inet6 fe80::e05c:f9ff:fe68:9914/64 scope link
       valid_lft forever preferred_lft forever
yuliachar@Virtual-linux:~$ sudo ip netns add testns123
yuliachar@Virtual-linux:~$ sudo ip netns list
testns123
yuliachar@Virtual-linux:~$ sudo ip netns exec testns123 bash
root@Virtual-linux:/home/yuliachar# sudo ip a
1: lo: <LOOPBACK> mtu 65536 qdisc noop state DOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
root@Virtual-linux:/home/yuliachar# ip a
1: lo: <LOOPBACK> mtu 65536 qdisc noop state DOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
12: veth1@if13: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 9a:c0:c1:7b:8e:f6 brd ff:ff:ff:ff:ff:ff link-netnsid 0
root@Virtual-linux:/home/yuliachar# ip addr add 10.0.0.2/24 dev veth1
root@Virtual-linux:/home/yuliachar# ip link set dev veth1 up
root@Virtual-linux:/home/yuliachar# ip a
1: lo: <LOOPBACK> mtu 65536 qdisc noop state DOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
12: veth1@if13: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 9a:c0:c1:7b:8e:f6 brd ff:ff:ff:ff:ff:ff link-netnsid 0
    inet 10.0.0.2/24 scope global veth1
       valid_lft forever preferred_lft forever
    inet6 fe80::98c0:c1ff:fe7b:8ef6/64 scope link
       valid_lft forever preferred_lft forever
root@Virtual-linux:/home/yuliachar# ping 10.0.0.1
PING 10.0.0.1 (10.0.0.1) 56(84) bytes of data.
64 bytes from 10.0.0.1: icmp_seq=1 ttl=64 time=0.145 ms
64 bytes from 10.0.0.1: icmp_seq=2 ttl=64 time=0.177 ms
64 bytes from 10.0.0.1: icmp_seq=3 ttl=64 time=0.063 ms
64 bytes from 10.0.0.1: icmp_seq=4 ttl=64 time=0.060 ms
64 bytes from 10.0.0.1: icmp_seq=5 ttl=64 time=0.065 ms
64 bytes from 10.0.0.1: icmp_seq=6 ttl=64 time=0.068 ms
64 bytes from 10.0.0.1: icmp_seq=7 ttl=64 time=0.054 ms
^C
--- 10.0.0.1 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6136ms
rtt min/avg/max/mdev = 0.054/0.090/0.177/0.045 ms
root@Virtual-linux:/home/yuliachar#
```

```
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:84:9f:02 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
       valid_lft 84127sec preferred_lft 84127sec
    inet6 fe80::c1a5:d122:7cd4:780e/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
3: br-9b108ca334d7: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default
    link/ether 02:42:b9:66:7c:80 brd ff:ff:ff:ff:ff:ff
    inet 172.18.0.1/16 brd 172.18.255.255 scope global br-9b108ca334d7
       valid_lft forever preferred_lft forever
    inet6 fe80::42:b9ff:fe66:7c80/64 scope link
       valid_lft forever preferred_lft forever
4: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default
    link/ether 02:42:14:cb:35:9d brd ff:ff:ff:ff:ff:ff
    inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
       valid_lft forever preferred_lft forever
5: br-8e418f48ba51: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default
    link/ether 02:42:d3:80:d1:d4 brd ff:ff:ff:ff:ff:ff
    inet 172.19.0.1/16 brd 172.19.255.255 scope global br-8e418f48ba51
       valid_lft forever preferred_lft forever
9: vethad7a738@if8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br-9b108ca334d7 state UP group default
    link/ether 02:72:74:49:f9:5c brd ff:ff:ff:ff:ff:ff link-netnsid 0
    inet6 fe80::72:74ff:fe49:f95c/64 scope link
       valid_lft forever preferred_lft forever
11: vethae56b82@if10: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br-9b108ca334d7 state UP group default
    link/ether e2:5c:f9:68:99:14 brd ff:ff:ff:ff:ff:ff link-netnsid 1
    inet6 fe80::e05c:f9ff:fe68:9914/64 scope link
       valid_lft forever preferred_lft forever
13: veth0@if12: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether ea:b9:00:97:ed:6d brd ff:ff:ff:ff:ff:ff link-netns testns123
    inet 10.0.0.1/24 scope global veth0
       valid_lft forever preferred_lft forever
    inet6 fe80::e8b9:ff:fe97:ed6d/64 scope link
       valid_lft forever preferred_lft forever
yuliachar@Virtual-linux:~$ ping 10.0.0.2
PING 10.0.0.2 (10.0.0.2) 56(84) bytes of data.
64 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=2.49 ms
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.052 ms
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.059 ms
64 bytes from 10.0.0.2: icmp_seq=4 ttl=64 time=0.055 ms
^C
--- 10.0.0.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3048ms
rtt min/avg/max/mdev = 0.052/0.664/2.493/1.055 ms
yuliachar@Virtual-linux:~$
```

```
yuliachar@Virtual-linux:/proc/3827$ cd ns/
yuliachar@Virtual-linux:/proc/3827/ns$ ls -l
итого 0
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 cgroup -> 'cgroup:[4026531835]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 ipc -> 'ipc:[4026531839]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 mnt -> 'mnt:[4026531841]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 net -> 'net:[4026531840]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 pid -> 'pid:[4026531836]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 pid_for_children -> 'pid:[4026531836]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 time -> 'time:[4026531834]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 time_for_children -> 'time:[4026531834]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 user -> 'user:[4026531837]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 uts -> 'uts:[4026531838]'
yuliachar@Virtual-linux:/proc/3827/ns$ sudo sudo unshare --net /bin/bash
[sudo] пароль для yuliachar:
root@Virtual-linux:/proc/3827/ns# ip a
1: lo: <LOOPBACK> mtu 65536 qdisc noop state DOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
root@Virtual-linux:/proc/3827/ns# ls -l /proc/$$/ns
итого 0
lrwxrwxrwx 1 root root 0 июл 16 16:37 cgroup -> 'cgroup:[4026531835]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 ipc -> 'ipc:[4026531839]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 mnt -> 'mnt:[4026531841]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 net -> 'net:[4026532508]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 pid -> 'pid:[4026531836]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 pid_for_children -> 'pid:[4026531836]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 time -> 'time:[4026531834]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 time_for_children -> 'time:[4026531834]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 user -> 'user:[4026531837]'
lrwxrwxrwx 1 root root 0 июл 16 16:37 uts -> 'uts:[4026531838]'
root@Virtual-linux:/proc/3827/ns# exit
exit
```

```
root@Virtual-linux:/proc/3827/ns# exit
exit
yuliachar@Virtual-linux:/proc/3827/ns$ ls -l /proc/$$/ns
итого 0
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 cgroup -> 'cgroup:[4026531835]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 ipc -> 'ipc:[4026531839]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 mnt -> 'mnt:[4026531841]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 net -> 'net:[4026531840]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 pid -> 'pid:[4026531836]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 pid_for_children -> 'pid:[4026531836]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 time -> 'time:[4026531834]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 time_for_children -> 'time:[4026531834]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 user -> 'user:[4026531837]'
lrwxrwxrwx 1 yuliachar yuliachar 0 июл 16 16:34 uts -> 'uts:[4026531838]'
yuliachar@Virtual-linux:/proc/3827/ns$ sudo unshare --pid --fork --mount-proc /bin/bash
root@Virtual-linux:/proc/3827/ns# ls -l /proc/$$/ns
итого 0
lrwxrwxrwx 1 root root 0 июл 16 16:41 cgroup -> 'cgroup:[4026531835]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 ipc -> 'ipc:[4026531839]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 mnt -> 'mnt:[4026532508]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 net -> 'net:[4026531840]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 pid -> 'pid:[4026532511]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 pid_for_children -> 'pid:[4026532511]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 time -> 'time:[4026531834]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 time_for_children -> 'time:[4026531834]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 user -> 'user:[4026531837]'
lrwxrwxrwx 1 root root 0 июл 16 16:41 uts -> 'uts:[4026531838]'
root@Virtual-linux:/proc/3827/ns#
```