

Задание: необходимо продемонстрировать изоляцию одного и того же приложения (как решено на семинаре - командного интерпретатора) в различных пространствах имен.

Сменен рут и доведен до работоспособности bash и cat.

```
user1@ubuntu-server:~$ mkdir hwl
user1@ubuntu-server:~$ mkdir hwl/bin
user1@ubuntu-server:~$ cp /bin/bash hwl/
user1@ubuntu-server:~$ ldd /bin/bash
        linux-vdso.so.1 (0x00007ffdbabef000)
        libtinfo.so.6 => /lib/x86_64-linux-gnu/libtinfo.so.6 (0x00007f5200751000)
        libdl.so.2 => /lib/x86_64-linux-gnu/libdl.so.2 (0x00007f520074b000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f5200559000)
        /lib64/ld-linux-x86-64.so.2 (0x00007f52008b6000)
user1@ubuntu-server:~$ mkdir hwl/lib
user1@ubuntu-server:~$ mkdir hwl/lib64
user1@ubuntu-server:~$ cp /bin/bash hwl/bin
user1@ubuntu-server:~$ cp /lib/x86_64-linux-gnu/libtinfo.so.6 hwl/lib
user1@ubuntu-server:~$ cp /lib/x86_64-linux-gnu/libdl.so.2 hwl/lib
user1@ubuntu-server:~$ cp /lib/x86_64-linux-gnu/libc.so.6 hwl/lib
user1@ubuntu-server:~$ cp /lib64/ld-linux-x86-64.so.2 hwl/lib64
user1@ubuntu-server:~$ chroot hwl
chroot: cannot change root directory to 'hwl': Operation not permitted
user1@ubuntu-server:~$ sudo chroot hwl
bash-5.0# ex \
> ^C
bash-5.0# exit
exit
user1@ubuntu-server:~$ ldd /bin/cat
        linux-vdso.so.1 (0x00007ffc34da8000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f21a6726000)
        /lib64/ld-linux-x86-64.so.2 (0x00007f21a692d000)
user1@ubuntu-server:~$ cd /bin/cat hwl/bin
-bash: cd: too many arguments
user1@ubuntu-server:~$ cp /bin/cat hwl/bin
user1@ubuntu-server:~$ sudo chroot hwl
bash-5.0# cat
вот и cat
вот и cat
^C
bash-5.0# cat -> tets
123
234
^C
```

Изоляция сети и настройка проброса трафика через виртуальные интерфейсы

Демонстрация работы пинга из родительского и дочернего пространства имен.

```
user1@ubuntu-server:~/hw1$ ip netns list
testnsnew (id: 0)
user1@ubuntu-server:~/hw1$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:98:d2:a8 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.65/24 brd 192.168.1.255 scope global dynamic enp0s3
        valid_lft 15864sec preferred_lft 15864sec
    inet6 fe80::a00:27ff:fe98:d2a8/64 scope link
        valid_lft forever preferred_lft forever
4: veth0@if3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether c2:40:44:a4:41:11 brd ff:ff:ff:ff:ff:ff link-netns testnsnew
    inet 10.0.0.1/24 scope global veth0
        valid_lft forever preferred_lft forever
    inet6 fe80::c040:44ff:fea4:4111/64 scope link
        valid_lft forever preferred_lft forever
user1@ubuntu-server:~/hw1$ 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=0.064 ms
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.059 ms
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.065 ms
^C
--- 10.0.0.2 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2088ms
rtt min/avg/max/mdev = 0.059/0.062/0.065/0.002 ms
user1@ubuntu-server:~/hw1$ sudo ip netnsnew exec testns bash
Object "netnsnew" is unknown, try "ip help".
user1@ubuntu-server:~/hw1$ sudo ip netnsn exec testnsnew bash
Object "netnsn" is unknown, try "ip help".
user1@ubuntu-server:~/hw1$ sudo ip netns exec testnsnew bash
root@ubuntu-server:/home/user1/hw1# 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=0.063 ms
64 bytes from 10.0.0.1: icmp_seq=2 ttl=64 time=0.058 ms
64 bytes from 10.0.0.1: icmp_seq=3 ttl=64 time=0.059 ms
64 bytes from 10.0.0.1: icmp_seq=4 ttl=64 time=0.115 ms
^C
--- 10.0.0.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3124ms
rtt min/avg/max/mdev = 0.058/0.073/0.115/0.023 ms
root@ubuntu-server:/home/user1/hw1# 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
3: veth1@if4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 1a:48:2b:ec:2f:13 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::1848:2bff:feec:2f13/64 scope link
        valid_lft forever preferred_lft forever
root@ubuntu-server:/home/user1/hw1#
```