



The n00bs' guide to DPDK and OVS-DPDK



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 **LINUX FOUNDATION**
COLLABORATIVE PROJECTS

Disclaimers



This presentation is targeted towards beginners who have never used DPDK or OVS-DPDK.

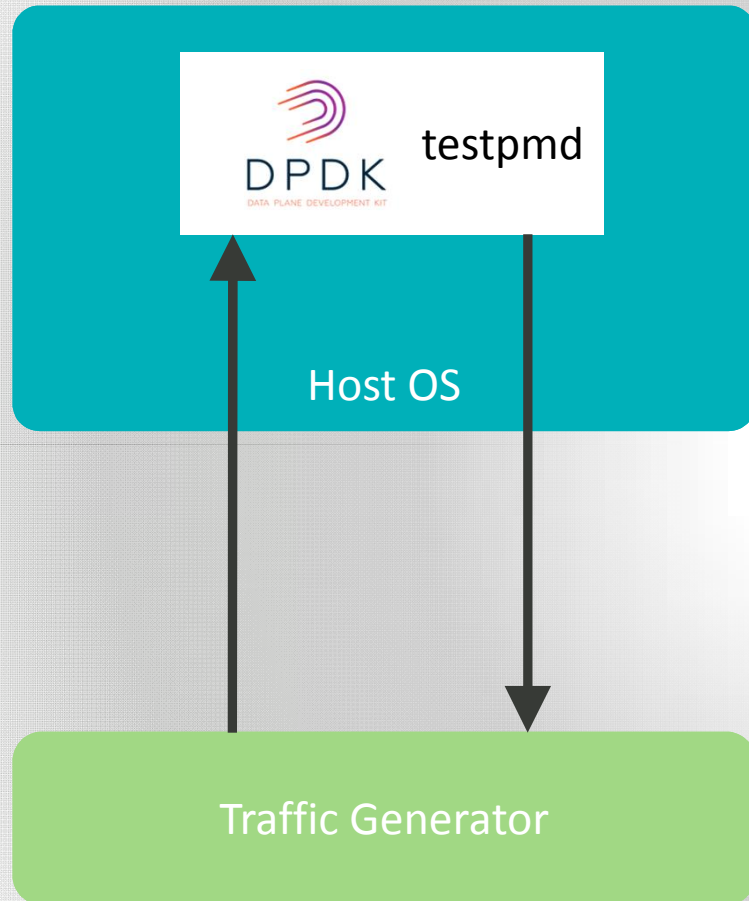
Text may be small if you are at the back, please feel free to move to the front! Or go to <https://goo.gl/mfrpSD>



Methodology is correct at this time but things change quickly! If you want to try this then check the versions!



DPDK testpmd



Software Versions

- Fedora 21
- DPDK v2.1.0


```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ git clone http://dpdk.org/git/dpdk
Cloning into 'dpdk'...
remote: Counting objects: 33767, done.
remote: Compressing objects: 100% (8205/8205), done.
remote: Total 33767 (delta 26610), reused 32051 (delta 25349)
Receiving objects: 100% (33767/33767), 22.57 MiB | 319.00 KiB/s, done.
Resolving deltas: 100% (26610/26610), done.
Checking connectivity... done.
-bash-4.3$ cd dpdk/
-bash-4.3$ █
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

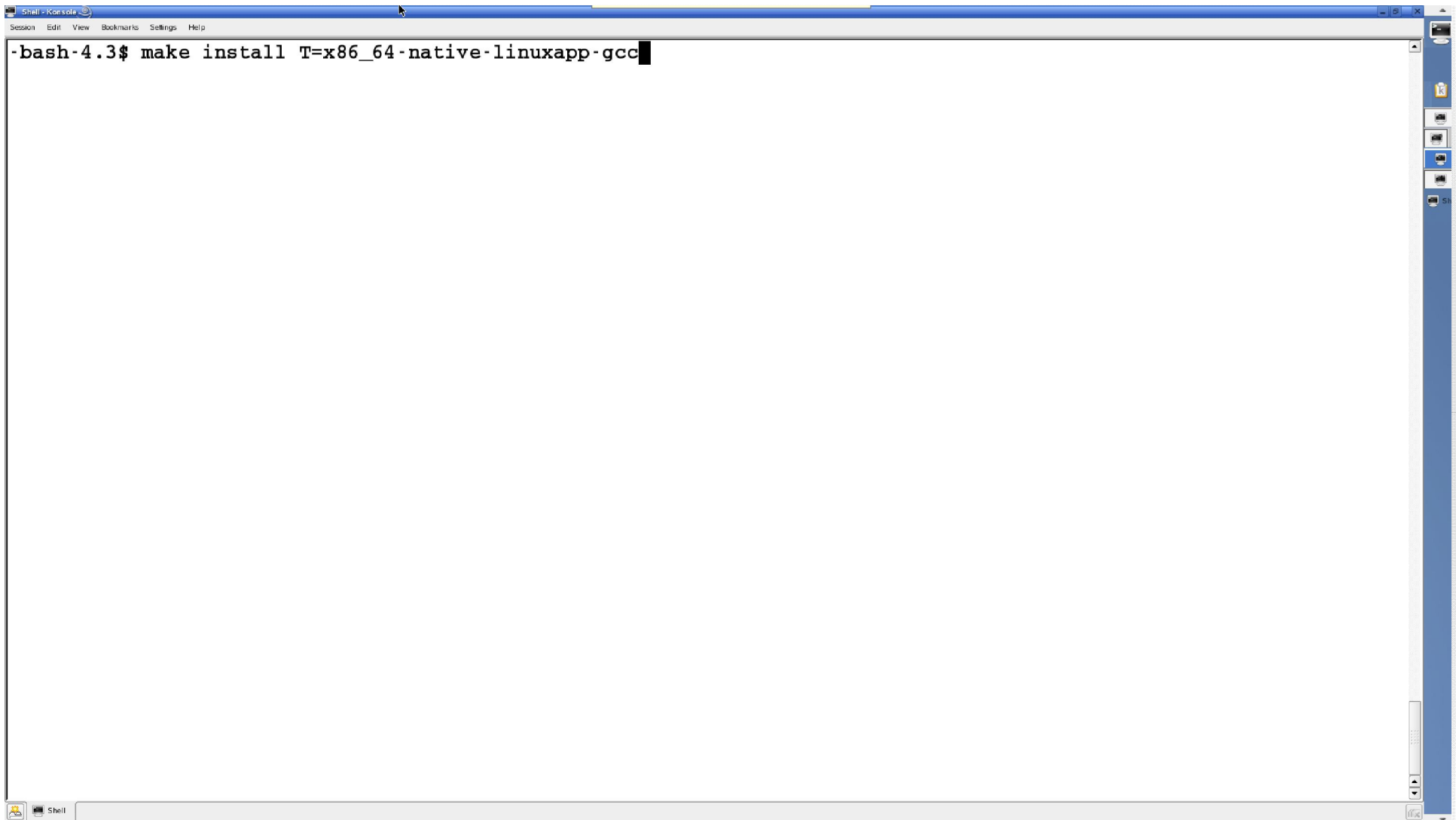
-bash-4.3$ git clone http://dpdk.org/git/dpdk
Cloning into 'dpdk'...
remote: Counting objects: 33767, done.
remote: Compressing objects: 100% (8205/8205), done.
remote: Total 33767 (delta 26610), reused 32051 (delta 25349)
Receiving objects: 100% (33767/33767), 22.57 MiB | 319.00 KiB/s, done.
Resolving deltas: 100% (26610/26610), done.
Checking connectivity... done.
-bash-4.3$ cd dpdk/
-bash-4.3$ git checkout v2.1.0
Note: checking out 'v2.1.0'.

You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by performing another checkout.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -b with the checkout command again. Example:

    git checkout -b new_branch_name

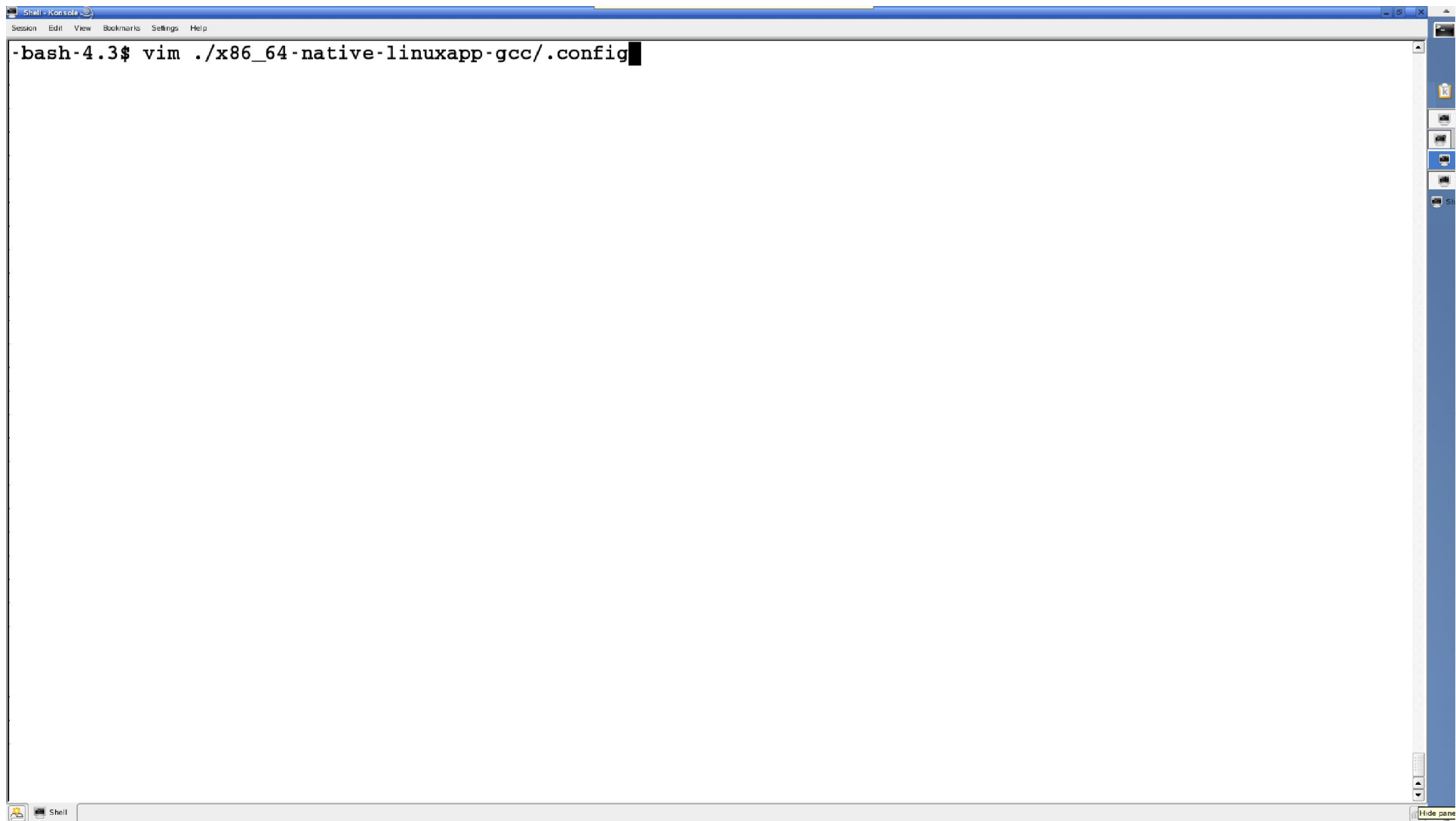
HEAD is now at 7173ace... version: 2.1.0
-bash-4.3$ reset
```

```
-bash-4.3$ make install T=x86_64-native-linuxapp-gcc
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

INSTALL-MAP testpipeline.map
== Build app/test-pmd
CC testpmd.o
CC parameters.o
CC cmdline.o
CC config.o
CC io fwd.o
CC mac fwd.o
CC mac fwd-retry.o
CC mac swap.o
CC flowgen.o
CC rxonly.o
CC txonly.o
CC csumonly.o
CC icmp echo.o
CC mempool_anon.o
LD testpmd
INSTALL-APP testpmd
INSTALL-MAP testpmd.map
== Build app/cmdline_test
CC cmdline_test.o
CC commands.o
LD cmdline_test
INSTALL-APP cmdline_test
INSTALL-MAP cmdline_test.map
== Build app/proc_info
CC main.o
LD proc_info
INSTALL-APP proc_info
INSTALL-MAP proc_info.map
Build complete [x86_64-native-linuxapp-gcc]
-bash-4.3$
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

80 ##
81 #CONFIG RTE TOOLCHAIN="gcc"
82 #CONFIG RTE TOOLCHAIN GCC=y
83 # Use intrinsics or assembly code for key routines
84 CONFIG RTE FORCE_INTRINSICS=n
85 # Machine forces strict alignment constraints.
86 CONFIG RTE ARCH_STRICT_ALIGN=n
87 # Compile to share library
88 CONFIG RTE BUILD_SHARED_LIBS=y
89 # Combine to one single library
90 CONFIG RTE BUILD_COMBINE_LIBS=y
91 # Use newest code breaking previous ABI
92 CONFIG RTE NEXT_ABI=y
93 # Compile Environment Abstraction Layer
94 CONFIG RTE LIBRTE_EAL=y
95 CONFIG RTE MAX_LCORE=128
96 CONFIG RTE MAX_NUMA_NODES=8
97 CONFIG RTE MAX_MEMSEG=256
98 CONFIG RTE MAX_MEMZONE=2560
99 CONFIG RTE MAX_TAILQ=32
100 CONFIG RTE LOG_LEVEL=8
101 CONFIG RTE LOG_HISTORY=256
102 CONFIG RTE LIBEAL_USE_HPET=n
103 CONFIG RTE EAL_ALLOW_INV_SOCKET_ID=n
104 CONFIG RTE EAL_ALWAYS_PANIC_ON_ERROR=n
105 CONFIG RTE EAL_IGB_UIO=y
106 CONFIG RTE EAL_VFIO=y
107 CONFIG RTE MALLOC_DEBUG=n
108 # Special configurations in PCI Config Space for high performance
109 CONFIG RTE PCI_CONFIG=n
```



```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ vim ./x86_64-native-linuxapp-gcc/.config
-bash-4.3$ make | tail
  CC commands.o
  LD cmdline_test
  INSTALL-APP cmdline_test
  INSTALL-MAP cmdline_test.map
== Build app/proc_info
  CC main.o
  LD proc_info
  INSTALL-APP proc_info
  INSTALL-MAP proc_info.map
Build complete [x86_64-native-linuxapp-gcc]
-bash-4.3$ █
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ pwd
/data/opnfv/dpdk
-bash-4.3$ export RTE_SDK=`pwd`
-bash-4.3$ export RTE_TARGET=x86_64-native-linuxapp-gcc
-bash-4.3$ cd app/test-pmd
-bash-4.3$ make
  CC testpmd.o
  CC parameters.o
  CC cmdline.o
  CC config.o
  CC iofwd.o
  CC macfwd.o
  CC macfwd-retry.o
  CC macswap.o
  CC flowgen.o
  CC rxonly.o
  CC txonly.o
  CC csumonly.o
  CC icmpecho.o
  CC mempool_anon.o
  LD testpmd
INSTALL-APP testpmd
INSTALL-MAP testpmd.map
-bash-4.3$ █
```



```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ # set up vfio
-bash-4.3$ sudo modprobe vfio-pci
-bash-4.3$ sudo /usr/bin/chmod a+x /dev/vfio
-bash-4.3$ sudo /usr/bin/chmod 0666 /dev/vfio/*
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ # set up vfio
-bash-4.3$ sudo modprobe vfio-pci
-bash-4.3$ sudo /usr/bin/chmod a+x /dev/vfio
-bash-4.3$ sudo /usr/bin/chmod 0666 /dev/vfio/*
-bash-4.3$
-bash-4.3$ # set up hugepages
-bash-4.3$ sudo sh -c "echo 1024 > /sys/kernel/mm/hugepages/hugepages-2048kB/nr_hugepages"
-bash-4.3$ sudo mount -t hugetlbfs nodev /mnt/huge
-bash-4.3$ █
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ $RTE_SDK/tools/dpdk_nic_bind.py --status

Network devices using DPDK-compatible driver
=====
<none>

Network devices using kernel driver
=====
0000:05:00.0 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p3p1 drv=ixgbe unused=vfio-pci
0000:05:00.1 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p3p2 drv=ixgbe unused=vfio-pci
0000:07:00.0 'Ethernet Controller X710 for 10GbE SFP+' if=p3p3 drv=i40e unused=vfio-pci
0000:07:00.1 'Ethernet Controller X710 for 10GbE SFP+' if=p3p4 drv=i40e unused=vfio-pci
0000:07:00.2 'Ethernet Controller X710 for 10GbE SFP+' if=p3p5 drv=i40e unused=vfio-pci
0000:07:00.3 'Ethernet Controller X710 for 10GbE SFP+' if=p3p6 drv=i40e unused=vfio-pci
0000:09:00.0 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p2p1 drv=ixgbe unused=vfio-pci
0000:09:00.1 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p2p2 drv=ixgbe unused=vfio-pci
0000:0c:00.0 'I350 Gigabit Network Connection' if=en0 drv=igb unused=vfio-pci *Active*
0000:0c:00.1 'I350 Gigabit Network Connection' if=enp12s0f1 drv=igb unused=vfio-pci
0000:0c:00.2 'I350 Gigabit Network Connection' if=enp12s0f2 drv=igb unused=vfio-pci
0000:0c:00.3 'I350 Gigabit Network Connection' if=enp12s0f3 drv=igb unused=vfio-pci
0000:81:00.0 'Ethernet Controller X710 for 10GbE SFP+' if=p5p1 drv=i40e unused=vfio-pci
0000:81:00.1 'Ethernet Controller X710 for 10GbE SFP+' if=p5p2 drv=i40e unused=vfio-pci
0000:81:00.2 'Ethernet Controller X710 for 10GbE SFP+' if=p5p3 drv=i40e unused=vfio-pci
0000:81:00.3 'Ethernet Controller X710 for 10GbE SFP+' if=p5p4 drv=i40e unused=vfio-pci

Other network devices
=====
<none>
-bash-4.3$
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ $RTE_SDK/tools/dpdk_nic_bind.py --status

Network devices using DPDK-compatible driver
=====
<none>

Network devices using kernel driver
=====
0000:05:00.0 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p3p1 drv=ixgbe unused=vfio-pci
0000:05:00.1 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p3p2 drv=ixgbe unused=vfio-pci
0000:07:00.0 'Ethernet Controller X710 for 10GbE SFP+' if=p3p3 drv=i40e unused=vfio-pci
0000:07:00.1 'Ethernet Controller X710 for 10GbE SFP+' if=p3p4 drv=i40e unused=vfio-pci
0000:07:00.2 'Ethernet Controller X710 for 10GbE SFP+' if=p3p5 drv=i40e unused=vfio-pci
0000:07:00.3 'Ethernet Controller X710 for 10GbE SFP+' if=p3p6 drv=i40e unused=vfio-pci
0000:09:00.0 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p2p1 drv=ixgbe unused=vfio-pci
0000:09:00.1 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p2p2 drv=ixgbe unused=vfio-pci
0000:0c:00.0 'I350 Gigabit Network Connection' if=en0 drv=igb unused=vfio-pci *Active*
0000:0c:00.1 'I350 Gigabit Network Connection' if=enp12s0f1 drv=igb unused=vfio-pci
0000:0c:00.2 'I350 Gigabit Network Connection' if=enp12s0f2 drv=igb unused=vfio-pci
0000:0c:00.3 'I350 Gigabit Network Connection' if=enp12s0f3 drv=igb unused=vfio-pci
0000:81:00.0 'Ethernet Controller X710 for 10GbE SFP+' if=p5p1 drv=i40e unused=vfio-pci
0000:81:00.1 'Ethernet Controller X710 for 10GbE SFP+' if=p5p2 drv=i40e unused=vfio-pci
0000:81:00.2 'Ethernet Controller X710 for 10GbE SFP+' if=p5p3 drv=i40e unused=vfio-pci
0000:81:00.3 'Ethernet Controller X710 for 10GbE SFP+' if=p5p4 drv=i40e unused=vfio-pci

Other network devices
=====
<none>
-bash-4.3$ sudo ./tools/dpdk_nic_bind.py --b vfio-pci 0000:81:00.0 0000:81:00.1
-bash-4.3$ █
```



```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ $RTE_SDK/tools/dpdk_nic_bind.py --status

Network devices using DPDK-compatible driver
-----
0000:81:00.0 'Ethernet Controller X710 for 10GbE SFP+' drv=vfio-pci unused=i40e
0000:81:00.1 'Ethernet Controller X710 for 10GbE SFP+' drv=vfio-pci unused=i40e

Network devices using kernel driver
=====
0000:05:00.0 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p3p1 drv=ixgbe unused=vfio-pci
0000:05:00.1 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p3p2 drv=ixgbe unused=vfio-pci
0000:07:00.0 'Ethernet Controller X710 for 10GbE SFP+' if=p3p3 drv=i40e unused=vfio-pci
0000:07:00.1 'Ethernet Controller X710 for 10GbE SFP+' if=p3p4 drv=i40e unused=vfio-pci
0000:07:00.2 'Ethernet Controller X710 for 10GbE SFP+' if=p3p5 drv=i40e unused=vfio-pci
0000:07:00.3 'Ethernet Controller X710 for 10GbE SFP+' if=p3p6 drv=i40e unused=vfio-pci
0000:09:00.0 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p2p1 drv=ixgbe unused=vfio-pci
0000:09:00.1 '82599ES 10-Gigabit SFI/SFP+ Network Connection' if=p2p2 drv=ixgbe unused=vfio-pci
0000:0c:00.0 'I350 Gigabit Network Connection' if=em0 drv=igb unused=vfio-pci *Active*
0000:0c:00.1 'I350 Gigabit Network Connection' if=enp12s0f1 drv=igb unused=vfio-pci
0000:0c:00.2 'I350 Gigabit Network Connection' if=enp12s0f2 drv=igb unused=vfio-pci
0000:0c:00.3 'I350 Gigabit Network Connection' if=enp12s0f3 drv=igb unused=vfio-pci
0000:81:00.2 'Ethernet Controller X710 for 10GbE SFP+' if=p5p3 drv=i40e unused=vfio-pci
0000:81:00.3 'Ethernet Controller X710 for 10GbE SFP+' if=p5p4 drv=i40e unused=vfio-pci

Other network devices
=====
<none>
-bash-4.3$
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo ./app/test-pmd/testpmd -c 0xF -n 4 -- -i --portmask=0x3 --nb-cores=2
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: Detected lcore 0 as core 0 on socket 0
EAL: Detected lcore 1 as core 1 on socket 0
EAL: Detected lcore 2 as core 2 on socket 0
EAL: Detected lcore 3 as core 3 on socket 0
EAL: Detected lcore 4 as core 4 on socket 0
EAL: Detected lcore 5 as core 8 on socket 0
EAL: Detected lcore 6 as core 9 on socket 0
EAL: Detected lcore 7 as core 10 on socket 0
EAL: Detected lcore 8 as core 11 on socket 0
EAL: Detected lcore 9 as core 12 on socket 0
EAL: Detected lcore 10 as core 0 on socket 1
EAL: Detected lcore 11 as core 1 on socket 1
EAL: Detected lcore 12 as core 2 on socket 1
EAL: Detected lcore 13 as core 3 on socket 1
EAL: Detected lcore 14 as core 4 on socket 1
EAL: Detected lcore 15 as core 8 on socket 1
EAL: Detected lcore 16 as core 9 on socket 1
EAL: Detected lcore 17 as core 10 on socket 1
EAL: Detected lcore 18 as core 11 on socket 1
EAL: Detected lcore 19 as core 12 on socket 1
EAL: Support maximum 128 logical core(s) by configuration.
EAL: Detected 20 lcore(s)
EAL: Setting up physically contiguous memory...
EAL: Ask a virtual area of 0x400000 bytes
EAL: Virtual area found at 0x7f8573200000 (size = 0x400000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f8572e00000 (size = 0x200000)
EAL: Ask a virtual area of 0xa400000 bytes
EAL: Virtual area found at 0x7f8568800000 (size = 0xa400000)
EAL: Ask a virtual area of 0x35400000 bytes
EAL: Virtual area found at 0x7f8533200000 (size = 0x35400000)
:
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f8532e00000 (size = 0x200000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f8532a00000 (size = 0x200000)
EAL: Ask a virtual area of 0x3fc00000 bytes
EAL: Virtual area found at 0x7f8412c00000 (size = 0x3fc00000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f84f2800000 (size = 0x200000)
EAL: Requesting 512 pages of size 2MB from socket 1
EAL: TSC frequency is ~2793268 KHz
EAL: Master lcore 0 is ready (tid=74fbe8c0;cpuset=[0])
EAL: lcore 3 is ready (tid=f17fd700;cpuset=[3])
EAL: lcore 2 is ready (tid=f1ffe700;cpuset=[2])
EAL: lcore 1 is ready (tid=f27ff700;cpuset=[1])
EAL: PCI device 0000:05:00.0 on NUMA socket 0
EAL:   probe driver: 8086:10fb rte_ixgbe_pmd
EAL:   Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:05:00.1 on NUMA socket 0
EAL:   probe driver: 8086:10fb rte_ixgbe_pmd
EAL:   Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:07:00.0 on NUMA socket 0
EAL:   probe driver: 8086:1572 rte_i40e_pmd
EAL:   Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:07:00.1 on NUMA socket 0
EAL:   probe driver: 8086:1572 rte_i40e_pmd
EAL:   Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:07:00.2 on NUMA socket 0
EAL:   probe driver: 8086:1572 rte_i40e_pmd
EAL:   Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:07:00.3 on NUMA socket 0
:
```



```
Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:09:00.0 on NUMA socket 0
EAL: probe driver: 8086:10fb rte_ixgbe_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:09:00.1 on NUMA socket 0
EAL: probe driver: 8086:10fb rte_ixgbe_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.0 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.1 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.2 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.3 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:81:00.0 on NUMA socket 1
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: PCI memory mapped at 0x7f84f07fd000
EAL: Trying to map BAR 3 that contains the MSI-X table. Trying offsets: 0x30000000000:0x0000, 0x1000:0x7000
EAL: PCI memory mapped at 0x7f8574fcf000
PMD: eth_i40e_dev_init(): FW 4.40 API 1.4 NVM 04.05.03 eetrack 80001dc1
PMD: eth_i40e_dev_init(): Failed to stop lldp
PMD: i40e_pf_parameter_init(): Max supported VSIs:34
PMD: i40e_pf_parameter_init(): PF queue pairs:64
PMD: i40e_pf_parameter_init(): Max VMDQ VSI num:34
PMD: i40e_pf_parameter_init(): VMDQ queue pairs:4
:
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: PCI memory mapped at 0x7fe4d43fd000
EAL: Trying to map BAR 3 that contains the MSI-X table. Trying offsets: 0x30000000000:0x0000, 0x1000:0x7000
EAL: PCI memory mapped at 0x7fe558a09000
PMD: eth_i40e_dev_init(): FW 4.40 API 1.4 NVM 04.05.03 eetrack 80001dc1
PMD: eth_i40e_dev_init(): Failed to stop lldp
PMD: i40e_pf_parameter_init(): Max supported VSIs:34
PMD: i40e_pf_parameter_init(): PF queue pairs:64
PMD: i40e_pf_parameter_init(): Max VMDQ VSI num:34
PMD: i40e_pf_parameter_init(): VMDQ queue pairs:4
EAL: PCI device 0000:81:00.2 on NUMA socket 1
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:81:00.3 on NUMA socket 1
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
Interactive-mode selected
Configuring Port 0 (socket 0)
PMD: i40e_dev_tx_queue_setup(): Using simple tx path
PMD: i40e_dev_rx_queue_setup(): Rx Burst Bulk Alloc Preconditions are satisfied. Rx Burst Bulk Alloc function will
be used on port=0, queue=0.
Port 0: 00:00:00:00:01:00
Configuring Port 1 (socket 0)
PMD: i40e_dev_tx_queue_setup(): Using simple tx path
PMD: i40e_dev_rx_queue_setup(): Rx Burst Bulk Alloc Preconditions are satisfied. Rx Burst Bulk Alloc function will
be used on port=1, queue=0.
Port 1: 00:00:00:00:01:01
Checking link statuses...
Port 0 Link Up - speed 10000 Mbps - full-duplex
Port 1 Link Up - speed 10000 Mbps - full-duplex
Done
testpmd> █
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

Port 1 Link Up - speed 10000 Mbps - full-duplex
Done
testpmd> help

Help is available for the following sections:

    help control      : Start and stop forwarding.
    help display      : Displaying port, stats and config information.
    help config       : Configuration information.
    help ports        : Configuring ports.
    help registers    : Reading and setting port registers.
    help filters      : Filters configuration help.
    help all          : All of the above sections.

testpmd> help control

Control forwarding:
-----

start
    Start packet forwarding with current configuration.

start tx_first
    Start packet forwarding with current config after sending one burst of packets.

stop
    Stop packet forwarding, and display accumulated statistics.

quit
    Quit to prompt.

testpmd> █
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

help config      : Configuration information.
help ports      : Configuring ports.
help registers   : Reading and setting port registers.
help filters     : Filters configuration help.
help all        : All of the above sections.

testpmd> help control

Control forwarding:
-----

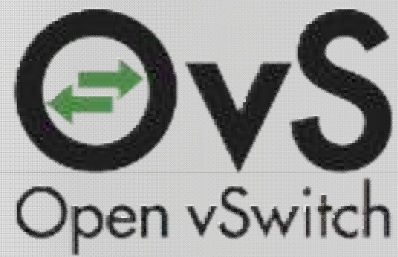
start
  Start packet forwarding with current configuration.

start tx_first
  Start packet forwarding with current config after sending one burst of packets.

stop
  Stop packet forwarding, and display accumulated statistics.

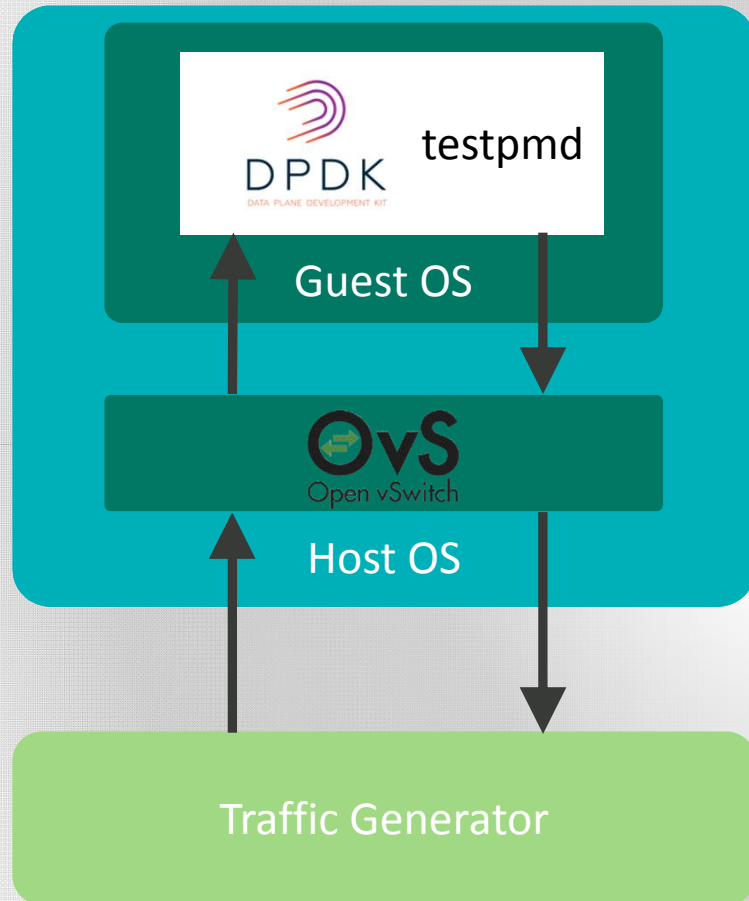
quit
  Quit to prompt.

testpmd> start
io packet forwarding - CRC stripping disabled - packets/burst=32
RX queues=1 - RX desc=128 - RX free threshold=32
RX threshold registers: pthresh=8 hthresh=8 wthresh=0
TX queues=1 - TX desc=512 - TX free threshold=32
TX threshold registers: pthresh=32 hthresh=0 wthresh=0
TX RS bit threshold=32 - TXQ flags=0xf01
testpmd> █
```

OVS-DPDK





Software Versions

- Fedora 21
- DPDK v2.1.0
- OVS v2.4
- Qemu 2.3

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ git clone https://github.com/openvswitch/ovs.git
Cloning into 'ovs'...
remote: Counting objects: 89279, done.
remote: Compressing objects: 100% (25/25), done.
remote: Total 89279 (delta 14), reused 0 (delta 0), pack-reused 89254
Receiving objects: 100% (89279/89279), 36.78 MiB | 115.00 KiB/s, done.
Resolving deltas: 100% (71391/71391), done.
Checking connectivity... done.
-bash-4.3$ █
```

```
root@slipisa0381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ cd ovs
-bash-4.3$ git checkout branch-2.4
Switched to branch 'branch-2.4'
Your branch is up-to-date with 'origin/branch-2.4'.
-bash-4.3$ DPK_BUILD=/data/opnfv/dpdk/x86_64-native-linuxapp-gcc
-bash-4.3$ ./boot.sh
libtoolize: putting auxiliary files in AC_CONFIG_AUX_DIR, `build-aux'.
libtoolize: copying file `build-aux/ltmain.sh'
libtoolize: putting macros in AC_CONFIG_MACRO_DIR, `m4'.
libtoolize: copying file `m4/libtool.m4'
libtoolize: copying file `m4/ltoptions.m4'
libtoolize: copying file `m4/ltsugar.m4'
libtoolize: copying file `m4/ltversion.m4'
libtoolize: copying file `m4/lt-obsolete.m4'
-bash-4.3$ ./configure --with-dpdk=$DPDK_BUILD > /dev/null 2>&1
-bash-4.3$ make CFLAGS='-O3 -march=native' | tail
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.4.h && \
touch include/openflow/openflow-1.4.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.5.h && \
touch include/openflow/openflow-1.5.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-common.h && \
touch include/openflow/openflow-common.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow.h && \
touch include/openflow/openflow.hstamp
make[2]: Leaving directory '/data/opnfv/ovs'
make[1]: Leaving directory '/data/opnfv/ovs'
-bash-4.3$ sudo make install >/dev/null 2>&1
-bash-4.3$ █
```

```
root@slipisa0381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ git checkout branch-2.4
Switched to branch 'branch-2.4'
Your branch is up-to-date with 'origin/branch-2.4'.
-bash-4.3$ DPK_BUILD=/data/opnfv/dpdk/x86_64-native-linuxapp-gcc
-bash-4.3$ ./boot.sh
libtoolize: putting auxiliary files in AC_CONFIG_AUX_DIR, `build-aux'.
libtoolize: copying file `build-aux/ltmain.sh'
libtoolize: putting macros in AC_CONFIG_MACRO_DIR, `m4'.
libtoolize: copying file `m4/libtool.m4'
libtoolize: copying file `m4/ltoptions.m4'
libtoolize: copying file `m4/ltsugar.m4'
libtoolize: copying file `m4/ltversion.m4'
libtoolize: copying file `m4/lt-obsolete.m4'
-bash-4.3$ ./configure --with-dpdk=$DPDK_BUILD > /dev/null 2>&1
-bash-4.3$ make CFLAGS='-O3 -march=native' | tail
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.4.h && \
touch include/openflow/openflow-1.4.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.5.h && \
touch include/openflow/openflow-1.5.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-common.h && \
touch include/openflow/openflow-common.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow.h && \
touch include/openflow/openflow.hstamp
make[2]: Leaving directory '/data/opnfv/ovs'
make[1]: Leaving directory '/data/opnfv/ovs'
-bash-4.3$ sudo make install >/dev/null 2>&1
-bash-4.3$ █
```



```
root@slipisa0381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ cd ovs
-bash-4.3$ git checkout branch-2.4
Switched to branch 'branch-2.4'
Your branch is up-to-date with 'origin/branch-2.4'.
-bash-4.3$ DPK_BUILD=/data/opnfv/dpdk/x86_64-native-linuxapp-gcc
-bash-4.3$ ./boot.sh
libtoolize: putting auxiliary files in AC_CONFIG_AUX_DIR, `build-aux'.
libtoolize: copying file `build-aux/ltmain.sh'
libtoolize: putting macros in AC_CONFIG_MACRO_DIR, `m4'.
libtoolize: copying file `m4/libtool.m4'
libtoolize: copying file `m4/ltoptions.m4'
libtoolize: copying file `m4/ltsugar.m4'
libtoolize: copying file `m4/ltversion.m4'
libtoolize: copying file `m4/lt-obsolete.m4'
-bash-4.3$ ./configure --with-dpdk=$DPDK_BUILD > /dev/null 2>&1
-bash-4.3$ make CFLAGS='-O3 -march=native' | tail
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.4.h && \
touch include/openflow/openflow-1.4.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.5.h && \
touch include/openflow/openflow-1.5.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-common.h && \
touch include/openflow/openflow-common.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow.h && \
touch include/openflow/openflow.hstamp
make[2]: Leaving directory '/data/opnfv/ovs'
make[1]: Leaving directory '/data/opnfv/ovs'
-bash-4.3$ sudo make install >/dev/null 2>&1
-bash-4.3$ █
```

```
root@slipisa0381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ cd ovs
-bash-4.3$ git checkout branch-2.4
Switched to branch 'branch-2.4'
Your branch is up-to-date with 'origin/branch-2.4'.
-bash-4.3$ DPK_BUILD=/data/opnfv/dpdk/x86_64-native-linuxapp-gcc
-bash-4.3$ ./boot.sh
libtoolize: putting auxiliary files in AC_CONFIG_AUX_DIR, `build-aux'.
libtoolize: copying file `build-aux/ltmain.sh'
libtoolize: putting macros in AC_CONFIG_MACRO_DIR, `m4'.
libtoolize: copying file `m4/libtool.m4'
libtoolize: copying file `m4/ltoptions.m4'
libtoolize: copying file `m4/ltugar.m4'
libtoolize: copying file `m4/ltversion.m4'
libtoolize: copying file `m4/ltlibtool.m4'
-bash-4.3$ ./configure --with-dpdk=$DPDK_BUILD > /dev/null 2>&1
-bash-4.3$ make CFLAGS='-O3 -march=native' | tail
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.4.h && \
touch include/openflow/openflow-1.4.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.5.h && \
touch include/openflow/openflow-1.5.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-common.h && \
touch include/openflow/openflow-common.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow.h && \
touch include/openflow/openflow.hstamp
make[2]: Leaving directory '/data/opnfv/ovs'
make[1]: Leaving directory '/data/opnfv/ovs'
-bash-4.3$ sudo make install >/dev/null 2>&1
-bash-4.3$ █
```

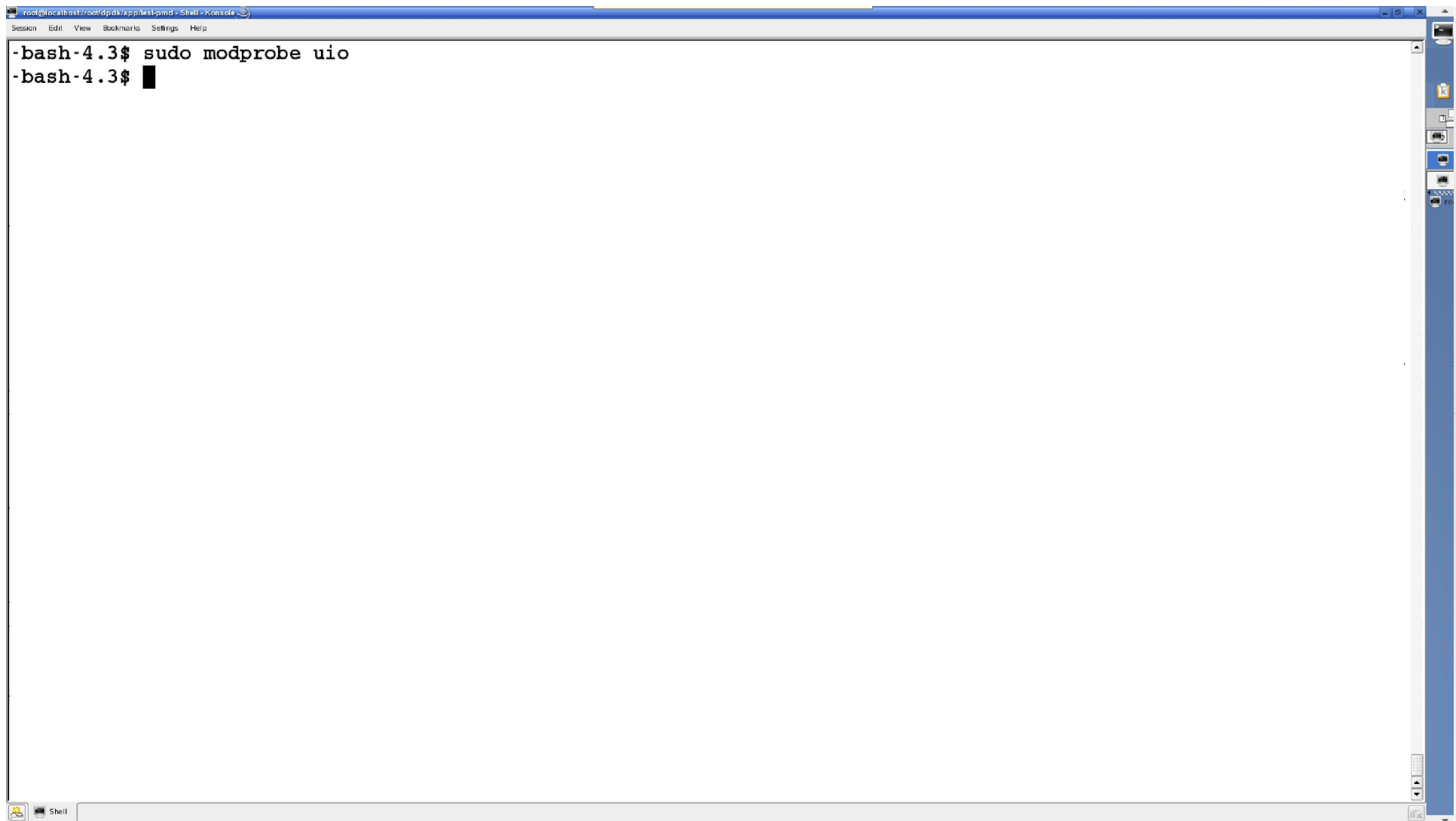
```
root@slipisa0381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ cd ovs
-bash-4.3$ git checkout branch-2.4
Switched to branch 'branch-2.4'
Your branch is up-to-date with 'origin/branch-2.4'.
-bash-4.3$ DPDK_BUILD=/data/opnfv/dpdk/x86_64-native-linuxapp-gcc
-bash-4.3$ ./boot.sh
libtoolize: putting auxiliary files in AC_CONFIG_AUX_DIR, `build-aux'.
libtoolize: copying file `build-aux/ltmain.sh'
libtoolize: putting macros in AC_CONFIG_MACRO_DIR, `m4'.
libtoolize: copying file `m4/libtool.m4'
libtoolize: copying file `m4/ltoptions.m4'
libtoolize: copying file `m4/ltsugar.m4'
libtoolize: copying file `m4/ltversion.m4'
libtoolize: copying file `m4/lt~obsolete.m4'
-bash-4.3$ make CFLAGS='-O3 -march=native' | tail
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.4.h && \
touch include/openflow/openflow-1.4.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.5.h && \
touch include/openflow/openflow-1.5.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-common.h && \
touch include/openflow/openflow-common.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow.h && \
touch include/openflow/openflow.hstamp
make[2]: Leaving directory '/data/opnfv/ovs'
make[1]: Leaving directory '/data/opnfv/ovs'
-bash-4.3$ sudo make install >/dev/null 2>&1
-bash-4.3$
```

```
root@slipisa0381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ cd ovs
-bash-4.3$ git checkout branch-2.4
Switched to branch 'branch-2.4'
Your branch is up-to-date with 'origin/branch-2.4'.
-bash-4.3$ DPK_BUILD=/data/opnfv/dpdk/x86_64-native-linuxapp-gcc
-bash-4.3$ ./boot.sh
libtoolize: putting auxiliary files in AC_CONFIG_AUX_DIR, `build-aux'.
libtoolize: copying file `build-aux/ltmain.sh'
libtoolize: putting macros in AC_CONFIG_MACRO_DIR, `m4'.
libtoolize: copying file `m4/libtool.m4'
libtoolize: copying file `m4/ltoptions.m4'
libtoolize: copying file `m4/ltsugar.m4'
libtoolize: copying file `m4/ltversion.m4'
libtoolize: copying file `m4/lt-obsolete.m4'
-bash-4.3$ ./configure --with-dpdk=$DPDK_BUILD > /dev/null 2>&1
-bash-4.3$ make CFLAGS='-O3 -march=native' | tail
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.4.h && \
touch include/openflow/openflow-1.4.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-1.5.h && \
touch include/openflow/openflow-1.5.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow-common.h && \
touch include/openflow/openflow-common.hstamp
PYTHONPATH=./python:"$PYTHONPATH PYTHONDONTWRITEBYTECODE=yes /usr/bin/python ./build-aux/check-structs -I./include
include/openflow/openflow.h && \
touch include/openflow/openflow.hstamp
make[2]: Leaving directory '/data/opnfv/ovs'
make[1]: Leaving directory '/data/opnfv/ovs'
-bash-4.3$ sudo make install >/dev/null 2>&1
-bash-4.3$ █
```

```
root@localhost:root/dpkg/app/let-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo modprobe uio
-bash-4.3$ █
```

A terminal window titled "root@localhost:root/dpkg/app/let-pmd - Shell - Konsole" with a menu bar containing "Session", "Edit", "View", "Bookmarks", "Settings", and "Help". The terminal content shows two lines: "-bash-4.3\$ sudo modprobe uio" followed by a new line "-bash-4.3\$ █" where the █ represents a cursor. The window has a blue title bar and a vertical toolbar on the right side with icons for file operations and navigation. At the bottom left, there is a taskbar with a "Shell" icon.


```
root@localhost:root/dpdk/app/lat-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo modprobe uio
-bash-4.3$
-bash-4.3$ sudo insmod $DPDK_BUILD/kmod/igb_uio.ko
-bash-4.3$ █
```

A screenshot of a terminal window titled "root@localhost:root/dpdk/app/lat-pmd - Shell - Konsole". The window has a menu bar with "Session", "Edit", "View", "Bookmarks", "Settings", and "Help". The terminal content shows four lines of shell commands: "-bash-4.3\$ sudo modprobe uio", "-bash-4.3\$", "-bash-4.3\$ sudo insmod \$DPDK_BUILD/kmod/igb_uio.ko", and "-bash-4.3\$ █". The cursor is a solid black block. The terminal window is part of a desktop environment with a blue taskbar on the right and a "Shell" icon in the bottom-left corner.

```
root@localhost:root/dpdk/app/kest-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo modprobe uio
-bash-4.3$
-bash-4.3$ sudo insmod $DPDK_BUILD/kmod/igb_uio.ko
-bash-4.3$
-bash-4.3$ sudo $RTE_SDK/tools/dpdk_nic_bind.py -b igb_uio 0000:05:00.0 0000:05:00.1
-bash-4.3$ sudo $RTE_SDK/tools/dpdk_nic_bind.py --status | head

Network devices using DPDK-compatible driver
=====
0000:05:00.0 '82599ES 10-Gigabit SFI/SFP+ Network Connection' drv=igb_uio unused=ixgbe
0000:05:00.1 '82599ES 10-Gigabit SFI/SFP+ Network Connection' drv=igb_uio unused=ixgbe

Network devices using kernel driver
=====
0000:07:00.0 'Ethernet Controller X710 for 10GbE SFP+' if=p3p3 drv=i40e unused=igb_uio
0000:07:00.1 'Ethernet Controller X710 for 10GbE SFP+' if=p3p4 drv=i40e unused=igb_uio
-bash-4.3$ █
```

```
root@localhost:root/dpdk/app/lest-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo modprobe uio
-bash-4.3$
-bash-4.3$ sudo insmod $DPDK_BUILD/kmod/igb_uio.ko
-bash-4.3$
-bash-4.3$ sudo $RTE_SDK/tools/dpdk_nic_bind.py -b igb_uio 0000:05:00.0 0000:05:00.1
-bash-4.3$ sudo $RTE_SDK/tools/dpdk_nic_bind.py --status | head

Network devices using DPDK-compatible driver
=====
0000:05:00.0 '82599ES 10-Gigabit SFI/SFP+ Network Connection' drv=igb_uio unused=ixgbe
0000:05:00.1 '82599ES 10-Gigabit SFI/SFP+ Network Connection' drv=igb_uio unused=ixgbe

Network devices using kernel driver
=====
0000:07:00.0 'Ethernet Controller X710 for 10GbE SFP+' if=p3p3 drv=i40e unused=igb_uio
0000:07:00.1 'Ethernet Controller X710 for 10GbE SFP+' if=p3p4 drv=i40e unused=igb_uio
-bash-4.3$
-bash-4.3$ sudo su -c "echo 8196 > /sys/kernel/mm/hugepages/hugepages-2048kB/nr_hugepages"
-bash-4.3$ sudo mount -t hugetlbfs nodev /mnt/huge
-bash-4.3$ cat /proc/meminfo | grep -i huge
AnonHugePages:          0 kB
HugePages_Total:       8196
HugePages_Free:        8196
HugePages_Rsvd:         0
HugePages_Surp:         0
Hugepagesize:          2048 kB
-bash-4.3$ █
```



```
root@localhost:root@dpdk/app/lat-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo mkdir -p /usr/local/etc/openvswitch
-bash-4.3$ sudo mkdir -p /usr/local/var/run/openvswitch
-bash-4.3$
-bash-4.3$ sudo rm /usr/local/etc/openvswitch/conf.db /usr/local/etc/openvswitch/.conf.db.~lock~
-bash-4.3$
-bash-4.3$ sudo /usr/local/bin/ovsdb-tool create /usr/local/etc/openvswitch/conf.db /usr/local/share/openvswitch/vs
witch.ovsschema
-bash-4.3$
-bash-4.3$ █
```



```
root@localhost:~# root@dpdk/app/leak-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo mkdir -p /usr/local/etc/openvswitch
-bash-4.3$ sudo mkdir -p /usr/local/var/run/openvswitch
-bash-4.3$
-bash-4.3$ sudo rm /usr/local/etc/openvswitch/conf.db /usr/local/etc/openvswitch/.conf.db.~lock~
-bash-4.3$
-bash-4.3$ sudo /usr/local/bin/ovsdb-tool create /usr/local/etc/openvswitch/conf.db /usr/local/share/openvswitch/vs
witch.ovsschema
-bash-4.3$
-bash-4.3$ sudo /usr/local/sbin/ovsdb-server --remote=punix:/usr/local/var/run/openvswitch/db.sock --remote=db:
Open_vSwitch,Open_vSwitch,manager_options --private-key=db:Open_vSwitch,SSL,private_key --certificate=Open_
vSwitch,SSL,certificate --bootstrap-ca-cert=db:Open_vSwitch,SSL,ca_cert --pidfile --detach
2015-11-06T14:29:49Z|00001|stream_ssl|ERR|SSL_use_certificate_file: error:02001002:system library:fopen:No such fil
e or directory
2015-11-06T14:29:49Z|00002|stream_ssl|ERR|SSL_use_PrivateKey_file: error:20074002: BIO routines:FILE_CTRL:system lib
-bash-4.3$
-bash-4.3$ █
```

```
root@localhost:~# root@dpdk/app/leak-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo mkdir -p /usr/local/etc/openvswitch
-bash-4.3$ sudo mkdir -p /usr/local/var/run/openvswitch
-bash-4.3$
-bash-4.3$ sudo rm /usr/local/etc/openvswitch/conf.db /usr/local/etc/openvswitch/.conf.db.~lock~
-bash-4.3$
-bash-4.3$ sudo /usr/local/bin/ovsdb-tool create /usr/local/etc/openvswitch/conf.db /usr/local/share/openvswitch/vs
witch.ovsschema
-bash-4.3$
-bash-4.3$ sudo /usr/local/sbin/ovsdb-server --remote=punix:/usr/local/var/run/openvswitch/db.sock --remote=db:
Open_vSwitch,Open_vSwitch,manager_options --private-key=db:Open_vSwitch,SSL,private_key --certificate=Open_
vSwitch,SSL,certificate --bootstrap-ca-cert=db:Open_vSwitch,SSL,ca_cert --pidfile --detach
2015-11-06T14:29:49Z|00001|stream_ssl|ERR|SSL_use_certificate_file: error:02001002:system library:fopen:No such fil
e or directory
2015-11-06T14:29:49Z|00002|stream_ssl|ERR|SSL_use_PrivateKey_file: error:20074002: BIO routines:FILE_CTRL:system lib
-bash-4.3$
-bash-4.3$
-bash-4.3$ sudo /usr/local/bin/ovs-vsctl --no-wait init
-bash-4.3$
-bash-4.3$ █
```

```
root@slpisa00381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo ovs-vswitchd --dpdk -c 0x1 -n 4 --socket-mem 1024,0 -- unix:/usr/local/var/run/openvswitch/db.sock
--log-file=/tmp/vswitchd.log --pidfile --detach | less █
```

```
root@slipisa00381991:~# Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: Detected lcore 0 as core 0 on socket 0
EAL: Detected lcore 1 as core 1 on socket 0
EAL: Detected lcore 2 as core 2 on socket 0
EAL: Detected lcore 3 as core 3 on socket 0
EAL: Detected lcore 4 as core 4 on socket 0
EAL: Detected lcore 5 as core 8 on socket 0
EAL: Detected lcore 6 as core 9 on socket 0
EAL: Detected lcore 7 as core 10 on socket 0
EAL: Detected lcore 8 as core 11 on socket 0
EAL: Detected lcore 9 as core 12 on socket 0
EAL: Detected lcore 10 as core 0 on socket 1
EAL: Detected lcore 11 as core 1 on socket 1
EAL: Detected lcore 12 as core 2 on socket 1
EAL: Detected lcore 13 as core 3 on socket 1
EAL: Detected lcore 14 as core 4 on socket 1
EAL: Detected lcore 15 as core 8 on socket 1
EAL: Detected lcore 16 as core 9 on socket 1
EAL: Detected lcore 17 as core 10 on socket 1
EAL: Detected lcore 18 as core 11 on socket 1
EAL: Detected lcore 19 as core 12 on socket 1
EAL: Support maximum 128 logical core(s) by configuration.
EAL: Detected 20 lcore(s)
EAL: VFIO modules not all loaded, skip VFIO support...
EAL: Searching for IVSHMEM devices...
EAL: No IVSHMEM configuration found!
EAL: Setting up memory...
EAL: Ask a virtual area of 0x400000 bytes
EAL: Virtual area found at 0x7f04d6400000 (size = 0x400000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f04d6000000 (size = 0x200000)
EAL: Ask a virtual area of 0x55000000 bytes
:█
```



Tahhan, Maryam
is now available

Untag Ignore

```
root@slipisa0381991:~# Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: Detected lcore 13 as core 3 on socket 1
EAL: Detected lcore 14 as core 4 on socket 1
EAL: Detected lcore 15 as core 8 on socket 1
EAL: Detected lcore 16 as core 9 on socket 1
EAL: Detected lcore 17 as core 10 on socket 1
EAL: Detected lcore 18 as core 11 on socket 1
EAL: Detected lcore 19 as core 12 on socket 1
EAL: Support maximum 128 logical core(s) by configuration.
EAL: Detected 20 lcore(s)
EAL: VFIO modules not all loaded, skip VFIO support...
EAL: Searching for IVSHMEM devices...
EAL: No IVSHMEM configuration found!
EAL: Setting up memory...
EAL: Ask a virtual area of 0x400000 bytes
EAL: Virtual area found at 0x7f04d6400000 (size = 0x400000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f04d6000000 (size = 0x200000)
EAL: Ask a virtual area of 0x55000000 bytes
EAL: Virtual area found at 0x7f0480e00000 (size = 0x55000000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f0480a00000 (size = 0x200000)
EAL: Ask a virtual area of 0x1aa400000 bytes
EAL: Virtual area found at 0x7f02d6400000 (size = 0x1aa400000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f04f7600000 (size = 0x200000)
EAL: Ask a virtual area of 0x600000 bytes
EAL: Virtual area found at 0x7f04f6e00000 (size = 0x600000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f04f6a00000 (size = 0x200000)
EAL: Ask a virtual area of 0x200000000 bytes
EAL: Virtual area found at 0x7f00d6200000 (size = 0x200000000)
█
```



```
root@slipisa0381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: Ask a virtual area of 0x600000 bytes
EAL: Virtual area found at 0x7f04f6e00000 (size = 0x600000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f04f6a00000 (size = 0x200000)
EAL: Ask a virtual area of 0x2000000000 bytes
EAL: Virtual area found at 0x7f00d6200000 (size = 0x200000000)
EAL: Ask a virtual area of 0x200000 bytes
EAL: Virtual area found at 0x7f04f6600000 (size = 0x200000)
EAL: Requesting 512 pages of size 2MB from socket 0
EAL: TSC frequency is ~2793269 KHz
EAL: Master core 0 is ready (tid=f9a77c00;cpuset=[0])
PMU: ENICPMD trace: rte_enic_pmd_init
EAL: PCI device 0000:05:00.0 on NUMA socket 0
EAL: probe driver: 8086:10fb rte_ixgbe_pmd
EAL: PCI memory mapped at 0x7f04d6800000
EAL: PCI memory mapped at 0x7f04d6880000
EAL: eth_ixgbe_dev_init(): MAC: 2, PHY: 17, SFP+: 5
EAL: eth_ixgbe_dev_init(): port 0 vendorID=0x8086 deviceID=0x10fb
EAL: PCI device 0000:05:00.1 on NUMA socket 0
EAL: probe driver: 8086:10fb rte_ixgbe_pmd
EAL: PCI memory mapped at 0x7f04d6884000
EAL: PCI memory mapped at 0x7f04d6904000
EAL: eth_ixgbe_dev_init(): MAC: 2, PHY: 17, SFP+: 6
EAL: eth_ixgbe_dev_init(): port 1 vendorID=0x8086 deviceID=0x10fb
:2015-11-06T09:11:26Z|00002|vlog|INFO|opened log file /tmp/vswitchd.log
2015-11-06T09:11:26Z|00003|ovs_numa|INFO|Discovered 10 CPU cores on NUMA node 0
2015-11-06T09:11:26Z|00004|ovs_numa|INFO|Discovered 10 CPU cores on NUMA node 1
2015-11-06T09:11:26Z|00005|ovs_numa|INFO|Discovered 2 NUMA nodes and 20 CPU cores
2015-11-06T09:11:26Z|00006|memory|INFO|3368 kB peak resident set size after 31.8 seconds
2015-11-06T09:11:26Z|00007|reconnect|INFO|unix:/usr/local/var/run/openvswitch/db.sock: connecting...
2015-11-06T09:11:26Z|00008|reconnect|INFO|unix:/usr/local/var/run/openvswitch/db.sock: connected

Shell
```

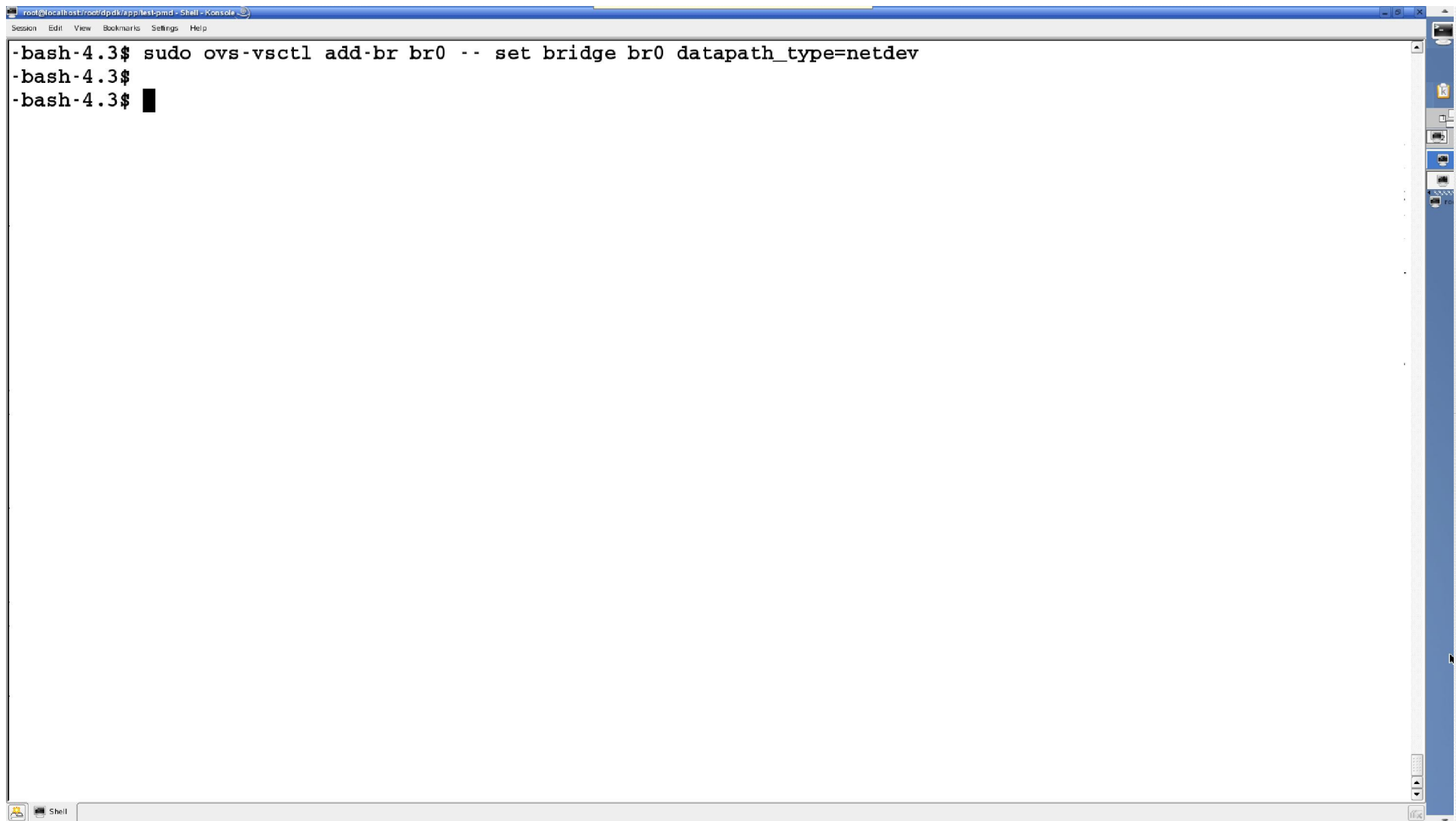
```
root@slipisa00381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: PCI device 0000:07:00.0 on NUMA socket 0
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:07:00.1 on NUMA socket 0
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:07:00.2 on NUMA socket 0
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:07:00.3 on NUMA socket 0
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:09:00.0 on NUMA socket 0
EAL: probe driver: 8086:10fb rte_ixgbe_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:09:00.1 on NUMA socket 0
EAL: probe driver: 8086:10fb rte_ixgbe_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.0 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.1 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.2 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.3 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:81:00.0 on NUMA socket 1
:
```

```
root@slipisa0381991:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: PCI device 0000:09:00.1 on NUMA socket 0
EAL: probe driver: 8086:10fb rte_ixgbe_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.0 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.1 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.2 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:0c:00.3 on NUMA socket 0
EAL: probe driver: 8086:1521 rte_igb_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:81:00.0 on NUMA socket 1
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:81:00.1 on NUMA socket 1
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:81:00.2 on NUMA socket 1
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:81:00.3 on NUMA socket 1
EAL: probe driver: 8086:1572 rte_i40e_pmd
EAL: Not managed by a supported kernel driver, skipped
Zone 0: name:<MALLOC_S0_HEAP_0>, phys:0x61400000, len:0xb00000, virt:0x7f0480e00000, socket_id:0, flags:0
Zone 1: name:<RG_MP_log_history>, phys:0x36200000, len:0x2080, virt:0x7f04d6000000, socket_id:0, flags:0
Zone 2: name:<MP_log_history>, phys:0x35c00000, len:0x28a0c0, virt:0x7f04d6400000, socket_id:0, flags:0
Zone 3: name:<rte_eth_dev_data>, phys:0x35e8a0c0, len:0x1f400, virt:0x7f04d668a0c0, socket_id:0, flags:0
(END)
```

```
root@localhost:root/dpdk/app/lat-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo ovs-vsctl add-br br0 -- set bridge br0 datapath_type=netdev
-bash-4.3$
-bash-4.3$ █
```



```
root@localhost:~# ovs-vsctl add-br br0 -- set bridge br0 datapath_type=netdev
-bash-4.3$ sudo ovs-vsctl add-br br0 -- set bridge br0 datapath_type=netdev
-bash-4.3$
-bash-4.3$ sudo ovs-vsctl add-port br0 dpdk0 -- set Interface dpdk0 type=dpdk
-bash-4.3$ sudo ovs-vsctl add-port br0 dpdk1 -- set Interface dpdk1 type=dpdk
-bash-4.3$
-bash-4.3$ █
```



```
root@localhost:~# ovs-vsctl add-br br0 -- set bridge br0 datapath_type=netdev
-bash-4.3$ sudo ovs-vsctl add-br br0 -- set bridge br0 datapath_type=netdev
-bash-4.3$
-bash-4.3$ sudo ovs-vsctl add-port br0 dpdk0 -- set Interface dpdk0 type=dpdk
-bash-4.3$ sudo ovs-vsctl add-port br0 dpdk1 -- set Interface dpdk1 type=dpdk
-bash-4.3$
-bash-4.3$ sudo ovs-vsctl add-port br0 vhost-user-0 -- set Interface vhost-user-0 type=dpdkvhostuser
-bash-4.3$ sudo ovs-vsctl add-port br0 vhost-user-1 -- set Interface vhost-user-1 type=dpdkvhostuser
-bash-4.3$
-bash-4.3$ █
```

```
root@localhost:root/dpdk/app/lat-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo ovs-vsctl add-br br0 -- set bridge br0 datapath_type=netdev
-bash-4.3$
-bash-4.3$ sudo ovs-vsctl add-port br0 dpdk0 -- set Interface dpdk0 type=dpdk
-bash-4.3$ sudo ovs-vsctl add-port br0 dpdk1 -- set Interface dpdk1 type=dpdk
-bash-4.3$
-bash-4.3$ sudo ovs-vsctl add-port br0 vhost-user-0 -- set Interface vhost-user-0 type=dpdkvhostuser
-bash-4.3$ sudo ovs-vsctl add-port br0 vhost-user-1 -- set Interface vhost-user-1 type=dpdkvhostuser
-bash-4.3$
-bash-4.3$
-bash-4.3$ ls -al /usr/local/var/run/openvswitch/vhost-user*
srwxr-xr-x 1 root root 0 Nov  6 14:51 /usr/local/var/run/openvswitch/vhost-user-0
srwxr-xr-x 1 root root 0 Nov  6 14:51 /usr/local/var/run/openvswitch/vhost-user-1
-bash-4.3$ █
```

```
root@localhost:~# ssh root@localhost -p 2222 -o StrictHostKeyChecking=no -o UserKnownHostsFile=/dev/null
root@localhost:~# sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable
-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch
/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:
01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,
id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backen
d-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
```

```
root@localhost:~# sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable
-bash-4.3$ sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable
-kvm -vnc :1 -net user,hostfwd=tcp::10022->::22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch
/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:
01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,
id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backen
d-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
```



```
root@localhost:~# sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable
-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch
/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:
01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,
id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backen
d-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
```

```
root@localhost:~# ssh root@localhost -p 2222 -o StrictHostKeyChecking=no -o UserKnownHostsFile=/dev/null
-bash-4.3$ sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable
-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch
/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:
1,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,
d=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backen
d-file,id=mem,size=4096M,mem-path=/mnt/nuge,share=on -numa node,memdev=mem -mem-prealloc
```

```
root@localhost:~# ssh root@192.168.1.100 -p 2222
root@localhost:~# sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable
-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch
/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:
01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,
q=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backend
-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
```

```
root@localhost:~# ssh root@localhost -p 2222 -o StrictHostKeyChecking=no -o UserKnownHostsFile=/dev/null -o LogLevel=ERROR -o ProxyCommand='ssh -W %h:%p root@localhost -p 2222 -o StrictHostKeyChecking=no -o UserKnownHostsFile=/dev/null -o LogLevel=ERROR'
-bash-4.3$ sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp:::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
qemu-system-x86_64: -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce: chardev "char0" went up
qemu-system-x86_64: -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce: chardev "char1" went up
█
```

```
root@localhost:root@dpdk/app/kest-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
qemu-system-x86_64: -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce: chardev "char0" went up
qemu-system-x86_64: -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce: chardev "char1" went up
^Z
[1]+  Stopped                  sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
-bash-4.3$ bg
[1]+ sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc &
-bash-4.3$ █
```



```
root@localhost:~# ssh root@localhost -p 10022
root@localhost:~# cd /root/dpdk/app/leak-pmd
root@localhost:~# ./leak-pmd
-bash-4.3$ sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
qemu-system-x86_64: -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce: chardev "char0" went up
qemu-system-x86_64: -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce: chardev "char1" went up
^Z
[1]+  Stopped                  sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc
-bash-4.3$ bg
[1]+ sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,path=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhost-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,netdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/mnt/huge,share=on -numa node,memdev=mem -mem-prealloc &
-bash-4.3$
-bash-4.3$
-bash-4.3$ scp -r -P 10022 $RTE_SDK root@localhost:/root/dpdk >/dev/null
root@localhost's password:
-bash-4.3$
-bash-4.3$ ssh root@localhost -p 10022
```

```
root@localhost:~/root/dpdk/app/test-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

[root@localhost ~]#
[root@localhost ~]# cd /root/dpdk
[root@localhost dpdk]# make install T=x86_64-native-linuxapp-gcc > /dev/null 2>&1

[root@localhost dpdk]# export RTE_SDK=$(pwd)
[root@localhost dpdk]#
[root@localhost dpdk]# export RTE_TARGET=x86_64-native-linuxapp-gcc
[root@localhost dpdk]#
[root@localhost dpdk]# cd app/test-pmd
[root@localhost test-pmd]# make
CC testpmd.o
CC parameters.o
CC cmdline.o
CC config.o
CC iofwd.o
CC macfwd.o
CC macfwd-retry.o
CC macswap.o
CC flowgen.o
CC rxonly.o
CC txonly.o
CC csumonly.o
CC icmpecho.o
CC mempool_anon.o
LD testpmd
INSTALL-APP testpmd
INSTALL-MAP testpmd.map
[root@localhost test-pmd]#
```

Guest OS

```
root@localhost:root/dpdk/app/test-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

[root@localhost test-pmd]# $RTE_SDK/tools/dpdk_nic_bind.py --status

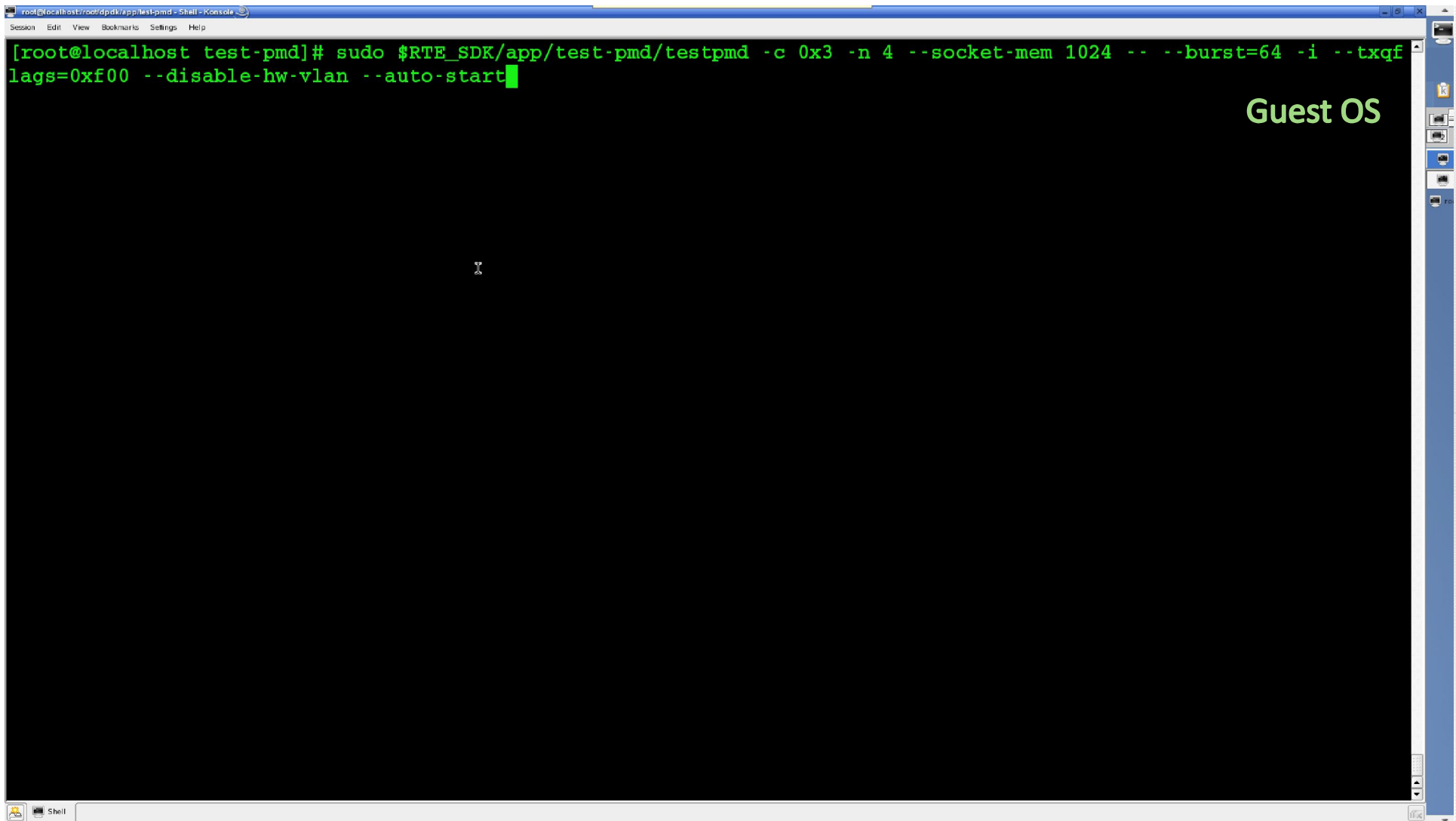
Network devices using DPDK-compatible driver
=====
<none>

Network devices using kernel driver
=====
0000:00:03.0 '82540EM Gigabit Ethernet Controller' if=ens3 drv=e1000 unused= *Active*

Other network devices
=====
0000:00:04.0 'Virtio network device' unused=virtio_pci
0000:00:05.0 'Virtio network device' unused=virtio_pci
[root@localhost test-pmd]#
[root@localhost test-pmd]# sudo modprobe uio
[root@localhost test-pmd]# sudo insmod $RTE_SDK/x86_64-native-linuxapp-gcc/kmod/igb_uio.ko
[root@localhost test-pmd]# sudo $RTE_SDK/tools/dpdk_nic_bind.py -b igb_uio 0000:00:04.0 0000:00:05.0
[root@localhost test-pmd]#
[root@localhost test-pmd]#
[root@localhost test-pmd]#
[root@localhost test-pmd]# echo 1024 > /sys/kernel/mm/hugepages/hugepages-2048kB/nr_hugepages
[root@localhost test-pmd]# mkdir /mnt/huge
[root@localhost test-pmd]# mount -t hugetlbfs nodev /mnt/huge
[root@localhost test-pmd]# █
```

Guest OS

```
root@localhost:root/dpdk/app/test-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
[root@localhost test-pmd]# sudo $RTE_SDK/app/test-pmd/testpmd -c 0x3 -n 4 --socket-mem 1024 -- --burst=64 -i --txqf
lags=0xf00 --disable-hw-vlan --auto-start
Guest OS
```



```
root@localhost:~# ./testpmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

EAL: Virtual area found at 0x7fb9c5400000 (size = 0xa00000)
EAL: Requesting 512 pages of size 2MB from socket 0
EAL: TSC frequency is ~2793267 KHz
EAL: WARNING: cpu flags constant_tsc=yes nonstop_tsc=no -> using unreliable clock cycles !
EAL: Master lcore 0 is ready (tid=49c828c0;cpuset=[0])
EAL: lcore 1 is ready (tid=479ff700;cpuset=[1])
EAL: PCI device 0000:00:03.0 on NUMA socket -1
EAL:  probe driver: 8086:100e rte_em_pmd
EAL:  Not managed by a supported kernel driver, skipped
EAL: PCI device 0000:00:04.0 on NUMA socket -1
EAL:  probe driver: 1af4:1000 rte_virtio_pmd
EAL: PCI device 0000:00:05.0 on NUMA socket -1
EAL:  probe driver: 1af4:1000 rte_virtio_pmd
Interactive-mode selected
Auto-start selected
Configuring Port 0 (socket 0)
Port 0: 00:00:00:00:00:01
Configuring Port 1 (socket 0)
Port 1: 00:00:00:00:00:02
Checking link statuses...
Port 0 Link Up - speed 10000 Mbps - full-duplex
Port 1 Link Up - speed 10000 Mbps - full-duplex
Done
Start automatic packet forwarding
  io packet forwarding - CRC stripping disabled - packets/burst=64
  nb forwarding cores=1 - nb forwarding ports=2
  RX queues=1 - RX desc=128 - RX free threshold=0
  RX threshold registers: pthresh=0 hthresh=0 wthresh=0
  TX queues=1 - TX desc=512 - TX free threshold=0
  TX threshold registers: pthresh=0 hthresh=0 wthresh=0
  TX RS bit threshold=0 - TXQ flags=0xf00
testpmd> █
```

Guest OS


```
root@localhost:~# sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
          tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704, frame=0, over=0, crc=0
          tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
             tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0
-bash-4.3$ █
```

```
root@localhost:~# ovs-app/ovs-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
          tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704, frame=0, over=0, crc=0
          tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
             tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl dump-flows br0
NXST_FLOW reply (xid=0x4):
  cookie=0x0, duration=552.553s, table=0, n_packets=312137114, n_bytes=18728229948, idle_age=0, priority=0 actions=N
  ORMAL
-bash-4.3$ █
```

```
root@localhost:~# ovs-vsctl add-port br0 dpdk1
root@localhost:~# ovs-vsctl add-port br0 vhost-user-1
root@localhost:~# ovs-vsctl add-port br0 vhost-user-0
root@localhost:~# ovs-vsctl add-port br0 local

-bash-4.3$ sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
         tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
         tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704, frame=0, over=0, crc=0
         tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
         tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
             tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0

-bash-4.3$
-bash-4.3$ sudo ovs-ofctl dump-flows br0
NXST_FLOW reply (xid=0x4):
 cookie=0x0, duration=552.553s, table=0, n_packets=312137114, n_bytes=18728229948, idle_age=0, priority=0 actions=NORMAL

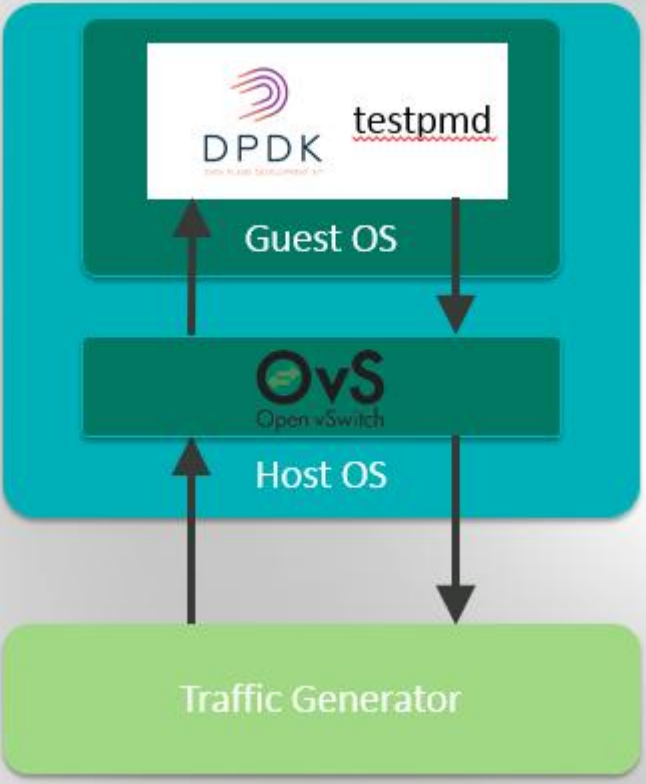
-bash-4.3$ sudo ovs-ofctl show br0 | grep addr
1(dpdk0): addr:00:1b:21:74:5b:64
2(dpdk1): addr:00:1b:21:74:5b:65
3(vhost-user-0): addr:00:00:00:00:00:00
4(vhost-user-1): addr:00:00:00:00:00:00
LOCAL(br0): addr:00:1b:21:74:5b:64
-bash-4.3$
```

```
root@localhost:root/dpdk/app/kest-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
          tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704, frame=0, over=0, crc=0
          tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
              tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl dump-flows br0
NXST_FLOW reply (xid=0x4):
  cookie=0x0, duration=552.553s, table=0, n_packets=312137114, n_bytes=18728229948, idle_age=0, priority=0 actions=N
  ORMAL
-bash-4.3$ sudo ovs-ofctl show br0 | grep addr
1(dpdk0): addr:00:1b:21:74:5b:64
2(dpdk1): addr:00:1b:21:74:5b:65
3(vhost-user-0): addr:00:00:00:00:00:00
4(vhost-user-1): addr:00:00:00:00:00:00
LOCAL(br0): addr:00:1b:21:74:5b:64
-bash-4.3$
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl del-flows br0
-bash-4.3$ █
```

```
root@localhost:root/dpdk/app/test-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

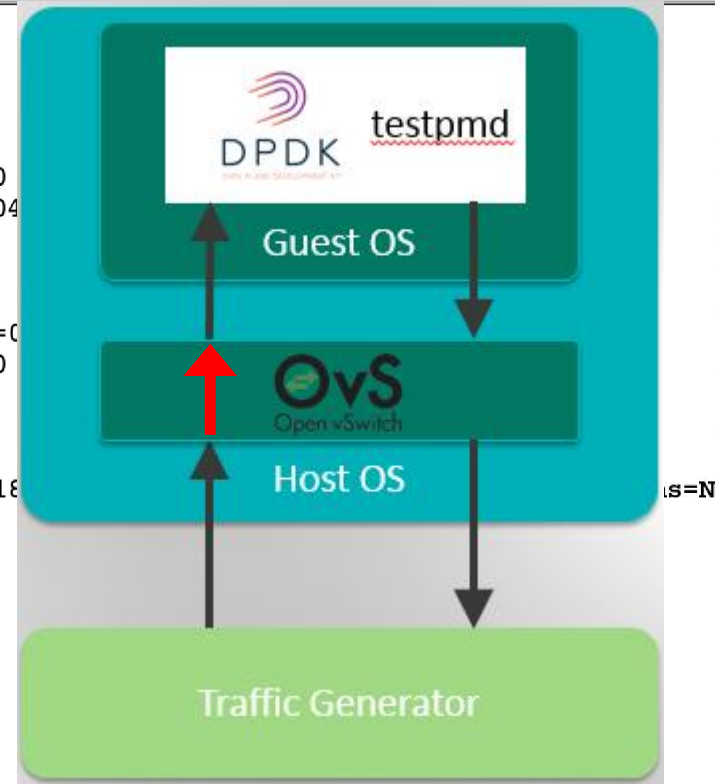
-bash-4.3$ sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
          tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704
          tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
             tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl dump-flows br0
NXST_FLOW reply (xid=0x4):
  cookie=0x0, duration=552.553s, table=0, n_packets=312137114, n_bytes=18
  NORMAL
-bash-4.3$ sudo ovs-ofctl show br0 | grep addr
  1(dpdk0):  addr:00:1b:21:74:5b:64
  2(dpdk1):  addr:00:1b:21:74:5b:65
  3(vhost-user-0):  addr:00:00:00:00:00:00
  4(vhost-user-1):  addr:00:00:00:00:00:00
  LOCAL(br0):  addr:00:1b:21:74:5b:64
-bash-4.3$
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl del-flows br0
-bash-4.3$ sudo ovs-ofctl add-flow br0 in_port=1,action=output:3
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl add-flow br0 in_port=4,action=output:2
-bash-4.3$ █
```



The diagram illustrates the network architecture. At the bottom, a green rounded rectangle labeled "Traffic Generator" has an upward-pointing arrow leading to a dark green rounded rectangle labeled "Host OS". Inside the Host OS, the "OvS Open vSwitch" logo is visible. From the Host OS, an upward-pointing arrow leads to a light blue rounded rectangle labeled "Guest OS". Inside the Guest OS, the "DPDK testpmd" logo is visible. A downward-pointing arrow from the Guest OS indicates traffic flow back to the Host OS. The entire Host OS and Guest OS components are enclosed within a larger light blue rounded rectangle.


```
root@localhost:root/dpdk/app/test-pmd - Shell - Konsole
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-bash-4.3$ sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
          tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704
          tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
             tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl dump-flows br0
NXST_FLOW reply (xid=0x4):
  cookie=0x0, duration=552.553s, table=0, n_packets=312137114, n_bytes=18
  NORMAL
  1(dpdk0): addr:00:1b:21:74:5b:64
  2(dpdk1): addr:00:1b:21:74:5b:64
  3(vhost-user-0): addr:00:00:00:00:00:00
  4(vhost-user-1): addr:00:00:00:00:00:00
  LOCAL(br0): addr:00:1b:21:74:5b:64
-bash-4.3$
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl del-flows br0
-bash-4.3$ sudo ovs-ofctl add-flow br0 in_port=1,action=output:3
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl add-flow br0 in_port=4,action=output:2
-bash-4.3$
```



```
root@localhost:root/dpdk/app/test-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
          tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704
          tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
             tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl dump-flows br0
NXST_FLOW reply (xid=0x4):
  cookie=0x0, duration=552.553s, table=0, n_packets=312137114, n_bytes=18
  NORMAL
-bash-4.3$ sudo ovs-ofctl show br0 | grep addr
  1(dpdk0): addr:00:1b:21:74:5b:64
  2(dpdk1): addr:00:1b:21:74:5b:64
  3(vhost-user-0): addr:00:00:00:00:00:00
  4(vhost-user-1): addr:00:00:00:00:00:00
  LOCAL(br0): addr:00:1b:21:74:5b:64
-bash-4.3$
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl del-flows br0
-bash-4.3$ sudo ovs-ofctl add-flow br0 in_port=1,action=output:3
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl add-flow br0 in_port=4,action=output:2
-bash-4.3$
```

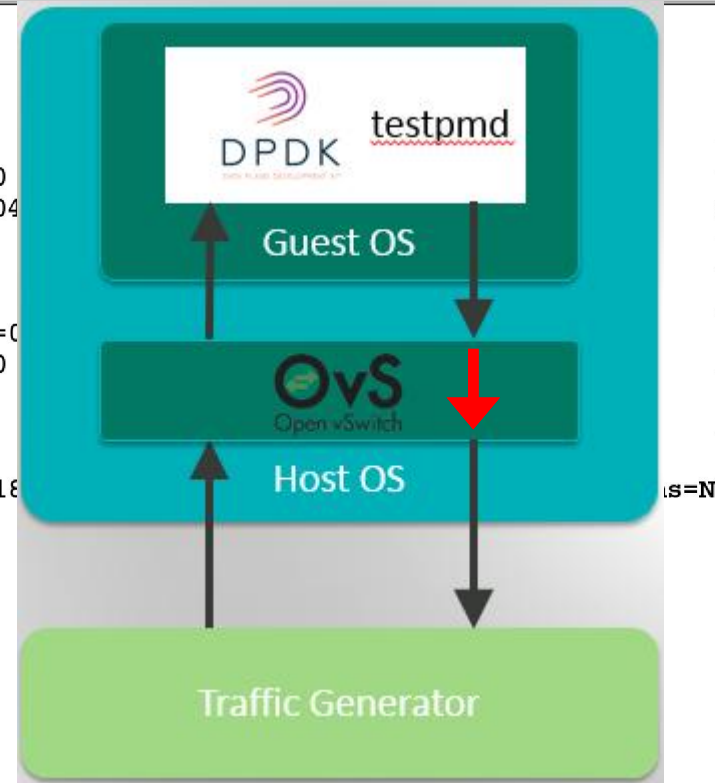
The diagram illustrates a network architecture with three main layers:

- Guest OS:** Contains DPDK and testpmd components. It is connected to the Host OS via bidirectional arrows.
- Host OS:** Contains the Open vSwitch (OvS). It is connected to the Guest OS and the Traffic Generator via bidirectional arrows. A red arrow points from the Host OS to the Guest OS.
- Traffic Generator:** A green box at the bottom that sends traffic to the Host OS.

Labels on the right side of the diagram include "Guest OS", "Host OS", and "Traffic Generator".

```
root@localhost:root/dpdk/app/test-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
          tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704
          tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
             tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl dump-flows br0
NXST_FLOW reply (xid=0x4):
  cookie=0x0, duration=552.553s, table=0, n_packets=312137114, n_bytes=18
  NORMAL
-bash-4.3$ sudo ovs-ofctl show br0 | grep addr
  1(dpdk0): addr:00:1b:21:74:5b:64
  2(dpdk1): addr:00:1b:21:74:5b:65
  3(vhost-user-0): addr:00:00:00:00:00:00
  4(vhost-user-1): addr:00:00:00:00:00:00
  LOCAL(br0): addr:00:1b:21:74:5b:64
-bash-4.3$
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl del-flows br0
-bash-4.3$ sudo ovs-ofctl add-flow br0 in port=1,action=output:3
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl add-flow br0 in port=4,action=output:2
-bash-4.3$
```



```
root@localhost:root/dpdk/app/test-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo ovs-ofctl dump-ports br0
OFPST_PORT reply (xid=0x2): 5 ports
  port 4: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6349151, bytes=?, drop=279255118, errs=?, coll=?
  port 2: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
          tx pkts=309817818, bytes=19828343460, drop=0, errs=0, coll=0
  port 1: rx pkts=310410783, bytes=19866290112, drop=0, errs=6862016704
          tx pkts=26, bytes=4772, drop=0, errs=0, coll=0
  port 3: rx pkts=13, bytes=?, drop=?, errs=?, frame=?, over=?, crc=?
          tx pkts=6371315, bytes=?, drop=279840282, errs=?, coll=?
  port LOCAL: rx pkts=0, bytes=0, drop=0, errs=0, frame=0, over=0, crc=0
             tx pkts=310408808, bytes=18624531588, drop=0, errs=0, coll=0
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl dump-flows br0
NXST_FLOW reply (xid=0x4):
  cookie=0x0, duration=552.553s, table=0, n_packets=312137114, n_bytes=18
  NORMAL
-bash-4.3$ sudo ovs-ofctl show br0 | grep addr
1(dpdk0): addr:00:1b:21:74:5b:64
2(dpdk1): addr:00:1b:21:74:5b:65
3(vhost-user-0): addr:00:00:00:00:00:00
4(vhost-user-1): addr:00:00:00:00:00:00
LOCAL(br0): addr:00:1b:21:74:5b:64
-bash-4.3$
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl del-flows br0
-bash-4.3$ sudo ovs-ofctl add-flow br0 in_port=1,action=output:3
-bash-4.3$
-bash-4.3$ sudo ovs-ofctl add-flow br0 in_port=4,action=output:2
-bash-4.3$
```

The diagram illustrates a network architecture with three main components: Guest OS, Host OS, and Traffic Generator. The Guest OS contains DPDK and testpmd. The Host OS contains Open vSwitch (OvS). The Traffic Generator is at the bottom. Arrows indicate traffic flow: a red arrow points from the Traffic Generator to the Host OS, and a black arrow points from the Host OS to the Guest OS. A red arrow also points from the Guest OS to the Host OS, and a black arrow points from the Host OS to the Traffic Generator.


```
root@localhost:~# ps -ef | grep qemu
root      32546    2102    0 12:14 pts/0    00:00:00 sudo qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qc
ow2 -snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=cha
r0,path=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -dev
ice virtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch
/vhost-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:
02,netdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/dev/hugepages,share=on -numa node,memdev=m
em -mem-prealloc
root      32547    32546  47 12:14 pts/0    00:17:05 qemu-system-x86_64 -cpu host -boot c -hda /root/fedora-21.qcow2 -
snapshot -m 4096M -smp 2 --enable-kvm -vnc :1 -net user,hostfwd=tcp::10022-:22 -net nic -chardev socket,id=char0,pa
th=/usr/local/var/run/openvswitch/vhost-user-0 -netdev type=vhost-user,id=mynet1,chardev=char0,vhostforce -device v
irtio-net-pci,mac=00:00:00:00:00:01,netdev=mynet1 -chardev socket,id=char1,path=/usr/local/var/run/openvswitch/vhos
t-user-1 -netdev type=vhost-user,id=mynet2,chardev=char1,vhostforce -device virtio-net-pci,mac=00:00:00:00:00:02,ne
tdev=mynet2 -object memory-backend-file,id=mem,size=4096M,mem-path=/dev/hugepages,share=on -numa node,memdev=mem -m
em-prealloc
mdgray   32968    32570    0 12:50 pts/2    00:00:00 grep --color=auto qemu
-bash-4.3$ top -H -p 32547
```

```
root@localhost:~# top - 12:50:40 up 4:03, 3 users, load average: 3.15, 3.02, 3.19
Threads: 5 total, 1 running, 4 sleeping, 0 stopped, 0 zombie
%Cpu(s): 5.0 us, 0.0 sy, 0.0 ni, 95.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 65932264 total, 47027900 free, 17223860 used, 1680504 buff/cache
KiB Swap: 2047996 total, 2047996 free, 0 used. 48376296 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND          nTH  P
 32551 root        20   0 5117216 57712 22744 R 48.8  0.1    5:36.15 qemu-system-x86     5   0
 32550 root        20   0 5117216 57712 22744 S  1.0  0.1    11:42.34 qemu-system-x86     5   0
 32547 root        20   0 5117216 57712 22744 S  0.0  0.1    0:04.92 qemu-system-x86     5   0
 32548 root        20   0 5117216 57712 22744 S  0.0  0.1    0:00.00 qemu-system-x86     5   0
 32553 root        20   0 5117216 57712 22744 S  0.0  0.1    0:00.00 qemu-system-x86     5   0
```



```
root@localhost:~# ssh root@localhost -p 2222 -o StrictHostKeyChecking=no -o UserKnownHostsFile=/dev/null
root@localhost:~# cd /root/dpdk/app/leaf-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo taskset -p 32551
pid 32551's current affinity mask: 1
-bash-4.3$
-bash-4.3$ sudo taskset -p 0x4 32551
pid 32551's current affinity mask: 1
pid 32551's new affinity mask: 4
-bash-4.3$ █
```

```
root@localhost:root/dpdk/app/kest-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

top - 12:52:32 up 4:05, 3 users, load average: 3.05, 3.01, 3.17
Threads: 352 total, 4 running, 346 sleeping, 2 stopped, 0 zombie
%Cpu(s): 10.0 us, 0.0 sy, 0.0 ni, 90.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 65932264 total, 47027264 free, 17224280 used, 1680720 buff/cache
KiB Swap: 2047996 total, 2047996 free, 0 used. 48375852 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND          nTH  P
 2551 root       20   0 5117216 57712 22744 R 99.9  0.1    7:11.40 qemu-system-x86     5   2
 2536 root       20   0 17.243g 10116  5396 R 99.0  0.0   20:49.01 pmd44             25   0

  1 root       20   0 120136   5828  3472 S  0.0  0.0    0:02.70 systemd          1   0
  2 root       20   0      0      0      0 S  0.0  0.0    0:00.00 kthreadd         1   0
  3 root       20   0      0      0      0 S  0.0  0.0    0:00.03 ksoftirqd/0     1   0
  5 root        0 -20      0      0      0 S  0.0  0.0    0:00.00 kworker/0:0H    1   0
  8 root       20   0      0      0      0 S  0.0  0.0    0:01.53 rcu_sched        1   0
  9 root       20   0      0      0      0 S  0.0  0.0    0:00.00 rcu_bh           1   0
 10 root       20   0      0      0      0 R  0.0  0.0    0:00.92 rcuos/0          1   0
 11 root       20   0      0      0      0 S  0.0  0.0    0:00.00 rcuob/0          1   0
 12 root       rt   0      0      0      0 S  0.0  0.0    0:00.03 migration/0     1   0
 13 root       rt   0      0      0      0 S  0.0  0.0    0:00.02 watchdog/0      1   0
 14 root       rt   0      0      0      0 S  0.0  0.0    0:00.01 watchdog/1      1   1
 15 root       rt   0      0      0      0 S  0.0  0.0    0:00.03 migration/1     1   1
 16 root       20   0      0      0      0 S  0.0  0.0    0:00.00 ksoftirqd/1     1   1
 17 root       20   0      0      0      0 S  0.0  0.0    0:00.00 kworker/1:0     1   1
 18 root        0 -20      0      0      0 S  0.0  0.0    0:00.00 kworker/1:0H    1   1
 19 root       20   0      0      0      0 S  0.0  0.0    0:00.00 rcuos/1          1   0
 20 root       20   0      0      0      0 S  0.0  0.0    0:00.00 rcuob/1          1   0
 21 root       rt   0      0      0      0 S  0.0  0.0    0:00.01 watchdog/2      1   2
 22 root       rt   0      0      0      0 S  0.0  0.0    0:00.03 migration/2     1   2
 23 root       20   0      0      0      0 S  0.0  0.0    0:00.00 ksoftirqd/2     1   2
 24 root       20   0      0      0      0 S  0.0  0.0    0:00.00 kworker/2:0     1   2
 25 root        0 -20      0      0      0 S  0.0  0.0    0:00.00 kworker/2:0H    1   2
```

```
root@localhost:root/dpdk/app/leaf-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo ovs-vsctl set Open_vSwitch . other_config:pmd-cpu-mask=30
-bash-4.3$
-bash-4.3$ top -H
```

```
root@localhost:root/dpdk/app/kest-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

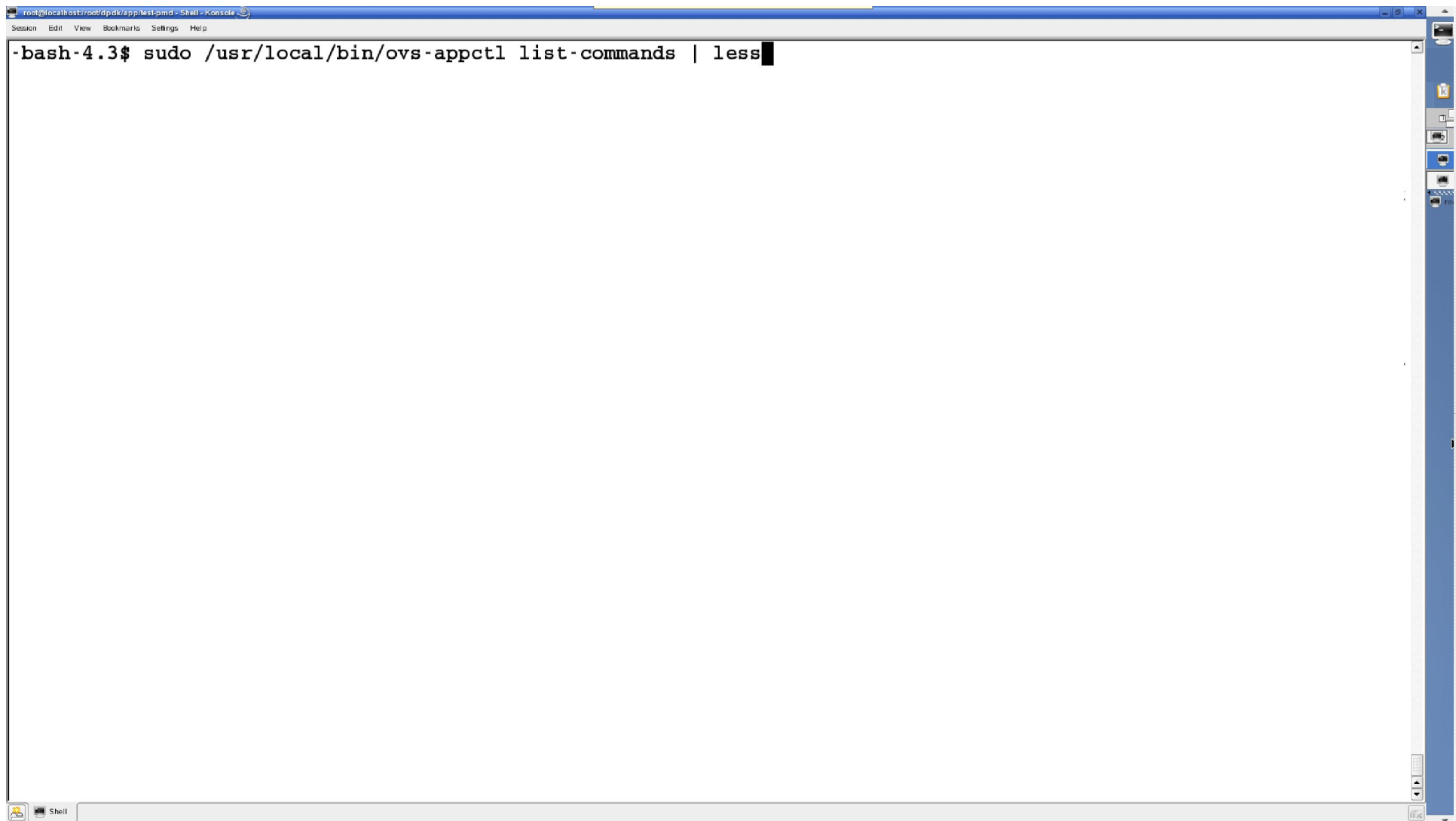
top - 12:53:26 up 4:06, 3 users, load average: 3.31, 3.08, 3.18
Threads: 353 total, 4 running, 347 sleeping, 2 stopped, 0 zombie
%Cpu(s): 15.0 us, 0.0 sy, 0.0 ni, 85.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 65932264 total, 47024456 free, 17226688 used, 1681120 buff/cache
KiB Swap: 2047996 total, 2047996 free, 0 used. 48373180 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
 32551 root        20   0 5117216 57712 22744 R 99.9  0.1   8:06.22 qemu-system-x86
 32991 root        20   0 17.316g 12928  5396 R 99.9  0.0   0:30.44 pmd46
 32992 root        20   0 17.316g 12928  5396 R 99.9  0.0   0:30.43 pmd45
31607 root        20   0     0     0     0 S  0.3  0.0   0:03.31 kworker/0:1
32970 root        20   0     0     0     0 S  0.3  0.0   0:00.04 kworker/0:5
 32996 mdgray     20   0  41032  3656  2856 R  0.3  0.0   0:00.02 top
     1 root        20   0 120136  5828  3472 S  0.0  0.0   0:02.70 systemd
     2 root        20   0     0     0     0 S  0.0  0.0   0:00.00 kthreadd
     3 root        20   0     0     0     0 S  0.0  0.0   0:00.03 ksoftirqd/0
     5 root         0 -20     0     0     0 S  0.0  0.0   0:00.00 kworker/0:0H
     8 root        20   0     0     0     0 S  0.0  0.0   0:01.53 rcu_sched
     9 root        20   0     0     0     0 S  0.0  0.0   0:00.00 rcu_bh
    10 root        20   0     0     0     0 S  0.0  0.0   0:00.92 rcuos/0
    11 root        20   0     0     0     0 S  0.0  0.0   0:00.00 rcuob/0
    12 root        rt    0     0     0     0 S  0.0  0.0   0:00.03 migration/0
    13 root        rt    0     0     0     0 S  0.0  0.0   0:00.02 watchdog/0
    14 root        rt    0     0     0     0 S  0.0  0.0   0:00.01 watchdog/1
    15 root        rt    0     0     0     0 S  0.0  0.0   0:00.03 migration/1
    16 root        20   0     0     0     0 S  0.0  0.0   0:00.00 ksoftirqd/1
    17 root        20   0     0     0     0 S  0.0  0.0   0:00.00 kworker/1:0
    18 root         0 -20     0     0     0 S  0.0  0.0   0:00.00 kworker/1:0H
    19 root        20   0     0     0     0 S  0.0  0.0   0:00.00 rcuos/1
    20 root        20   0     0     0     0 S  0.0  0.0   0:00.00 rcuob/1
    21 root        rt    0     0     0     0 S  0.0  0.0   0:00.01 watchdog/2
    22 root        rt    0     0     0     0 S  0.0  0.0   0:00.03 migration/2
```

nTH	P
5	2
26	4
26	5



```
root@localhost:root/dpkg/app/ovs-appctl - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo /usr/local/bin/ovs-appctl list-commands | less
```




```
root@localhost:~# dpctl/app/ispd - Shell - Konsole
Session Edit View Bookmarks Settings Help

The available commands are:
autoattach/show-isid      [bridge]
autoattach/statistics    [bridge]
autoattach/status        [bridge]
bfd/set-forwarding       [interface] normal|false|true
bfd/show                 [interface]
bond/disable-slave       port slave
bond/enable-slave        port slave
bond/hash                 mac [vlan] [basis]
bond/list
bond/migrate             port hash slave
bond/set-active-slave    port slave
bond/show                [port]
bridge/dump-flows        bridge
bridge/reconnect         [bridge]
cfm/set-fault            [interface] normal|false|true
cfm/show                 [interface]
coverage/show
dpctl/add-dp
dpctl/add-flow
dpctl/add-if
dpctl/del-dp
dpctl/del-flow
dpctl/del-flows
dpctl/del-if
dpctl/dump-dps
dpctl/dump-flows
dpctl/get-flow
dpctl/help
dpctl/list-commands
dpctl/mod-flow
```

```
root@localhost:~# dpctl/normalize-actions
dpctl/parse-actions
dpctl/get-if
dpctl/show
dpif-netdev/pmd-stats-clear [dp]
dpif-netdev/pmd-stats-show [dp]
dpif/dump-dps
dpif/dump-flows [-m] bridge
dpif/show
exit
fdb/flush [bridge]
fdb/show bridge
lacp/show [port]
list-commands
mdb/flush [bridge]
mdb/show bridge
memory/show
netdev-dpdk/set-admin-state [netdev] up|down
ofproto/list
ofproto/tnl-push-pop [on] | [off]
ofproto/trace {[dp_name] odp_flow | bridge br_flow} [-generate|packet]
ofproto/trace-packet-out [-consistent] {[dp_name] odp_flow | bridge br_flow} [-generate|packet] actions
ovs/route/add ipv4_addr/prefix_len out_br_name gw
ovs/route/del ipv4_addr/prefix_len
ovs/route/lookup ipv4_addr
ovs/route/show
qos/show interface
revalidator/purge
revalidator/wait
rstp/tcn [bridge]
stp/tcn [bridge]
```

```
root@localhost:root@dpx/app/let-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

netdev-dpdk/set-admin-state [netdev] up|down
ofproto/list
ofproto/tnl-push-pop      [on] | [off]
ofproto/trace             {[dp_name] odp_flow | bridge br_flow} [-generate|packet]
ofproto/trace-packet-out [-consistent] {[dp_name] odp_flow | bridge br_flow} [-generate|packet] actions
ovs/route/add             ipv4_addr/prefix_len out_br_name gw
ovs/route/del            ipv4_addr/prefix_len
ovs/route/lookup         ipv4_addr
ovs/route/show
qos/show                 interface
revalidator/purge
revalidator/wait
rstp/tcn                  [bridge]
stp/tcn                   [bridge]
tnl/arp/flush
tnl/arp/show
tnl/egress_port_range    min max
tnl/ports/show
upcall/disable-megaflows
upcall/disable-ufid
upcall/enable-megaflows
upcall/enable-ufid
upcall/set-flow-limit
upcall/show
vlog/disable-rate-limit [module]...
vlog/enable-rate-limit  [module]...
vlog/list
vlog/list-pattern
vlog/reopen
vlog/set                  {spec | PATTERN:destination:pattern}
^D
```

```
root@localhost:root/dpdk/app/lat-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo /usr/local/bin/ovs-appctl dpif-netdev/pmd-stats-show
main thread:
  emc hits:0
  megaflow hits:0
  miss:0
  lost:0
  polling cycles:0 (0.00%)
  processing cycles:0 (0.00%)
pmd thread numa_id 0 core_id 4:
  emc hits:220603917
  megaflow hits:1
  miss:117624114
  lost:0
  polling cycles:40517648196 (4.58%)
  processing cycles:844264107028 (95.42%)
  avg cycles per packet: 2615.93 (884781755224/338228032)
  avg processing cycles per packet: 2496.14 (844264107028/338228032)
pmd thread numa_id 0 core_id 5:
  emc hits:220592571
  megaflow hits:0
  miss:115970059
  lost:0
  polling cycles:119153835092 (13.59%)
  processing cycles:757658212248 (86.41%)
  avg cycles per packet: 2605.20 (876812047340/336562630)
  avg processing cycles per packet: 2251.17 (757658212248/336562630)
-bash-4.3$ █
```

```
root@localhost:~# ovs-appctl dpif/dump-flows br0
-bash-4.3$
-bash-4.3$ sudo ovs-appctl dpif/dump-flows br0
recirc_id(0),in_port(2),eth_type(0x0800),ipv4(frag=no), packets:779364046, bytes:46761842760, used:0.000s, actions:
4
recirc_id(0),in_port(5),eth_type(0x0800),ipv4(frag=no), packets:779323755, bytes:46759425300, used:0.000s, actions:
3
-bash-4.3$
-bash-4.3$ sudo ovs-appctl dpctl/dump-flows
flow-dump from pmd on cpu core: 4
recirc_id(0),in_port(2),eth_type(0x0800),ipv4(frag=no), packets:811038478, bytes:48662308680, used:0.000s, actions:
4
flow-dump from pmd on cpu core: 5
recirc_id(0),in_port(5),eth_type(0x0800),ipv4(frag=no), packets:810996765, bytes:48659805900, used:0.000s, actions:
3
-bash-4.3$ █
```

```
root@localhost:root/dpdk/app/kest-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$
-bash-4.3$
-bash-4.3$ tail -n 20 /tmp/vswitchd.log
2015-11-06T12:44:17.517Z|00051|dpdk(vhost_thread2)|INFO|vHost Device '/usr/local/var/run/openvswitch/vhost-user-0'
(0) has been removed
2015-11-06T12:44:17.583Z|00052|dpdk(vhost_thread2)|INFO|vHost Device '/usr/local/var/run/openvswitch/vhost-user-1'
(1) has been removed
2015-11-06T12:45:18.983Z|00053|dpdk(vhost_thread2)|INFO|vHost Device '/usr/local/var/run/openvswitch/vhost-user-0'
(0) has been added
2015-11-06T12:45:18.984Z|00054|dpdk(vhost_thread2)|INFO|vHost Device '/usr/local/var/run/openvswitch/vhost-user-1'
(1) has been added
2015-11-06T12:45:57.563Z|00031|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 deletes)
2015-11-06T12:46:14.945Z|00032|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 deletes)
2015-11-06T12:46:14.997Z|00033|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 adds)
2015-11-06T12:46:15.205Z|00034|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 adds)
2015-11-06T12:46:39.279Z|00035|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 deletes)
2015-11-06T12:46:53.666Z|00036|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 adds)
2015-11-06T12:47:20.261Z|00037|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 deletes)
2015-11-06T12:47:20.715Z|00038|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 adds)
2015-11-06T12:47:23.323Z|00039|connmgr|INFO|br0<->unix: 1 flow_mods in the last 0 s (1 adds)
2015-11-06T12:52:56.402Z|00040|dpif_netdev|INFO|Created 2 pmd threads on numa node 0
2015-11-06T12:52:56.404Z|00001|dpif_netdev(pmd45)|INFO|Core 5 processing port 'vhost-user-0'
2015-11-06T12:52:56.404Z|00002|dpif_netdev(pmd45)|INFO|Core 5 processing port 'vhost-user-1'
2015-11-06T12:52:56.405Z|00001|dpif_netdev(pmd46)|INFO|Core 4 processing port 'dpdk1'
2015-11-06T12:52:56.405Z|00002|dpif_netdev(pmd46)|INFO|Core 4 processing port 'dpdk0'
2015-11-06T12:56:12.846Z|00041|dpif|WARN|failed to enumerate system datapaths: No such file or directory
2015-11-06T13:00:44.465Z|00042|dpif|WARN|failed to enumerate system datapaths: No such file or directory
-bash-4.3$
```



```
root@localhost:root/dpdk/app/ovs-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help
-bash-4.3$ sudo ovs-appctl vlog/set ANY:file:DBG
-bash-4.3$ sudo ovs-appctl vlog/list | head
      console      syslog      file
-----
backtrace         OFF         INFO         DBG
bfd               OFF         INFO         DBG
bond              OFF         INFO         DBG
bridge            OFF         INFO         DBG
bundle            OFF         INFO         DBG
bundles           OFF         INFO         DBG
cfm               OFF         INFO         DBG
classifier         OFF         INFO         DBG
-bash-4.3$ █
```

```
root@localhost:root/dpdk/app/ovs-pmd - Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ sudo ovs-appctl vlog/set ANY:file:DBG
-bash-4.3$ cat /tmp/vswitchd.log | tail -n 15
2015-11-06T13:13:09.776Z|02903|dpif(pmd56)|DBG|netdev@ovs-netdev: get_stats success
2015-11-06T13:13:09.807Z|02904|dpif_netdev(pmd56)|DBG|Dropped 31755 log messages in last 0 seconds (most recently,
0 seconds ago) due to excessive rate
2015-11-06T13:13:09.807Z|02905|dpif_netdev(pmd56)|DBG|ovs-netdev: miss upcall:
skb_priority(0),skb_mark(0),recirc_id(0),dp_hash(0),in_port(2),eth(src=12:34:24:34:53:53,dst=42:35:66:32:46:43),eth
_type(0x0800),ipv4(src=1.12.3.3,dst=2.2.6.2,proto=17,tos=0,ttl=64,frag=no),udp(src=63,dst=63)
udp,vlan_tci=0x0000,dl_src=12:34:24:34:53:53,dl_dst=42:35:66:32:46:43,nw_src=1.12.3.3,nw_dst=2.2.6.2,nw_tos=0,nw_ec
n=0,nw_ttl=64,tp_src=63,tp_dst=63 udp_csum:aad8
2015-11-06T13:13:09.877Z|02906|dpif(pmd56)|DBG|netdev@ovs-netdev: get_stats success
2015-11-06T13:13:09.907Z|02907|dpif_netdev(pmd56)|DBG|Dropped 32622 log messages in last 0 seconds (most recently,
0 seconds ago) due to excessive rate
2015-11-06T13:13:09.907Z|02908|dpif_netdev(pmd56)|DBG|ovs-netdev: miss upcall:
skb_priority(0),skb_mark(0),recirc_id(0),dp_hash(0),in_port(2),eth(src=12:34:24:34:53:53,dst=42:35:66:32:46:43),eth
_type(0x0800),ipv4(src=1.12.3.3,dst=2.2.6.2,proto=17,tos=0,ttl=64,frag=no),udp(src=63,dst=63)
udp,vlan_tci=0x0000,dl_src=12:34:24:34:53:53,dl_dst=42:35:66:32:46:43,nw_src=1.12.3.3,nw_dst=2.2.6.2,nw_tos=0,nw_ec
n=0,nw_ttl=64,tp_src=63,tp_dst=63 udp_csum:aad8
2015-11-06T13:13:09.978Z|02909|dpif(pmd56)|DBG|netdev@ovs-netdev: get_stats success
2015-11-06T13:13:10.007Z|02910|dpif_netdev(pmd56)|DBG|Dropped 32187 log messages in last 0 seconds (most recently,
0 seconds ago) due to excessive rate
2015-11-06T13:13:10.007Z|02911|dpif_netdev(pmd56)|DBG|ovs-netdev: miss upcall:
skb_priority(0),skb_mark(0),recirc_id(0),dp_hash(0),in_port(2),eth(src=12:34:24:34:53:53,dst=42:35:66:32:46:43),eth
_type(0x0800),ipv4(src=1.12.3.3,dst=2.2.6.2,proto=17,tos=0,ttl=64,frag=no),udp(src=63,dst=63)
udp,vlan_tci=0x0000,dl_src=12:34:24:34:53:53,dl_dst=42:35:66:32:46:43,nw_src=1.12.3.3,nw_dst=2.2.6.2,nw_tos=0,nw_ec
n=0,nw_ttl=64,tp_src=63,tp_dst=63 udp_csum:aad8
-bash-4.3$ sudo ovs-appctl vlog/set ANY:file:INFO
-bash-4.3$ █
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

79 ## Can be gcc, icc or clang.
80 ##
81 #CONFIG RTE TOOLCHAIN="gcc"
82 #CONFIG RTE TOOLCHAIN GCC=y
83 # Use intrinsics or assembly code for key routines
84 CONFIG RTE FORCE_INTRINSICS=n
85 # Machine forces strict alignment constraints.
86 CONFIG RTE ARCH_STRICT_ALIGN=n
87 # Compile to share library
88 CONFIG RTE BUILD_SHARED_LIB=n
89 # Combine to one single library
90 CONFIG RTE BUILD_COMBINE_LIBS=n
91 # Use newest code breaking previous ABI
92 CONFIG RTE NEXT_ABI=y
93 # Compile Environment Abstraction Layer
94 CONFIG RTE LIBRTE_EAL=y
95 CONFIG RTE MAX_LCORE=128
96 CONFIG RTE MAX_NUMA_NODES=8
97 CONFIG RTE MAX_MEMSEG=256
98 CONFIG RTE MAX_MEMZONE=2560
99 CONFIG RTE MAX_TAILQ=32
100 CONFIG RTE LOG_LEVEL=8
101 CONFIG RTE LOG_HISTORY=256
102 CONFIG RTE LIBEAL_USE_HPET=n
103 CONFIG RTE EAL_ALLOW_INV_SOCKET_ID=n
104 CONFIG RTE EAL_ALWAYS_PANIC_ON_ERROR=n
105 CONFIG RTE EAL_IGB_UIO=y
106 CONFIG RTE EAL_VFIO=y
107 CONFIG RTE MALLOC_DEBUG=n
108 ## Special configurations in PCI Config Space for high performance
```

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

-bash-4.3$ vim ./x86_64-native-linuxapp-gcc/.config
-bash-4.3$ cat ./x86_64-native-linuxapp-gcc/.config | grep LIBRTE_VHOST
CONFIG_RTE_LIBRTE_VHOST=y
CONFIG_RTE_LIBRTE_VHOST_USER=y
CONFIG_RTE_LIBRTE_VHOST_NUMA=n
CONFIG_RTE_LIBRTE_VHOST_DEBUG=n
-bash-4.3$ cat ./x86_64-native-linuxapp-gcc/.config | grep SHARED_
CONFIG_RTE_BUILD_SHARED_LIB=n
-bash-4.3$ cat ./x86_64-native-linuxapp-gcc/.config | grep COMBINE_LIBS
CONFIG_RTE_BUILD_COMBINE_LIBS=n
-bash-4.3$ cat ./x86_64-native-linuxapp-gcc/.config | grep DEBUG_ | head
CONFIG_RTE_LIBRTE_E1000_DEBUG_INIT=n
CONFIG_RTE_LIBRTE_E1000_DEBUG_RX=n
CONFIG_RTE_LIBRTE_E1000_DEBUG_TX=n
CONFIG_RTE_LIBRTE_E1000_DEBUG_TX_FREE=n
CONFIG_RTE_LIBRTE_E1000_DEBUG_DRIVER=n
CONFIG_RTE_LIBRTE_IXGBE_DEBUG_INIT=n
CONFIG_RTE_LIBRTE_IXGBE_DEBUG_RX=n
CONFIG_RTE_LIBRTE_IXGBE_DEBUG_TX=n
CONFIG_RTE_LIBRTE_IXGBE_DEBUG_TX_FREE=n
CONFIG_RTE_LIBRTE_IXGBE_DEBUG_DRIVER=n
-bash-4.3$ █
```



```
Shell - Konsole
Session Edit View Bookmarks Settings Help

testpmd>
testpmd>
testpmd>
testpmd>
testpmd>
testpmd>
testpmd>
testpmd>
testpmd>
testpmd> stop
Telling cores to stop...
Waiting for lcores to finish...

----- Forward statistics for port 0 -----
RX-packets: 42561034      RX-dropped: 0      RX-total: 42561034
TX-packets: 0            TX-dropped: 0      TX-total: 0
-----

----- Forward statistics for port 1 -----
RX-packets: 0            RX-dropped: 0      RX-total: 0
TX-packets: 42554964     TX-dropped: 0      TX-total: 42554964
-----

+++++ Accumulated forward statistics for all ports+++++
RX-packets: 42561034      RX-dropped: 0      RX-total: 42561034
TX-packets: 42554964     TX-dropped: 0      TX-total: 42554964
+++++

Done.
testpmd> quit
Stopping port 0...done
-bash-4.3$
```