

OVS-DPDK on LS2088ARDB

DPDK is a user space packet processing framework. OVS-DPDK is a popular software switching package which uses DPDK as the underlying platform.

1. LSDK 1809 Images Deployment

Download flexbuilder

```
$ cd flexbuild_lsdk1809 && . ./setup.env
```

Locally generate default Ubuntu rootfs with configurable packages

```
$ flex-builder -i mkrfs -a arm64
```

Download prebuild NXP component and install them into rootfs

```
$ wget http://www.nxp.com/lgfiles/sdk/lsdk1809/app\_components\_arm64.tgz
```

```
$ wget http://www.nxp.com/lgfiles/sdk/lsdk1809/bootpartition\_arm64\_lts\_4.14.tgz
```

```
$ wget http://www.nxp.com/lgfiles/sdk/lsdk1809/arm64-modules-4.14.67.tgz
```

```
$ tar xvzf app_components_arm64.tgz -C build/apps
```

```
$ sudo tar xvzf arm64-modules-4.14.67.tgz -C  
build/rfs/rootfs_ubuntu_bionic_arm64/lib/modules
```

```
$ flex-builder -i merge-component -a arm64
```

```
$ flex-builder -i compressrfs -a arm64 (optional)
```

Deploy boot partition and rootfs on sdcard

```
$ flex-installer -b bootpartition_arm64_lts_4.14.tgz -r build/rfs/rootfs_ubuntu_bionic_arm64 -d  
/dev/sdb
```

Update u-boot in vBank2 with the one provided in /boot from vBank1

```
$ ext2load mmc 0:2 a0000000 firmware_ls2088ardb_uboot_norboot.img
```

```
$ protect off 584000000 +
```

```
$ protect off 584000000 +$filesize&& erase 584000000 +$filesize&& cp.ba0000000  
584000000 $filesize
```

```
$ qixis_reset altbank
```

update DPL file to enable 8 ports (remove static dpmac.5)

Configure DPAA2 config files

```
# git clone https://source.codeaurora.org/external/qoriq/qoriq-components/mc-utils
# cd mc-utils
# git checkout -b LSDK-18.09 LSDK-18.09
Remove dpni@0 and connection@0 nodes in ./config/ls2088a/RDB/dpl-eth.0x2A_0x41.dts.
# dtc -I dts -O dtb config/ls2088a/RDB/dpl-eth.0x2A_0x41.dts -o config/ls2088a/RDB/dpl-
eth.0x2A_0x41.dtb
# cp config/ls2088a/RDB/dpl-eth.0x2A_0x41.dtb /boot
```

```
Update image in NOR flash (from u-boot vBank0)
ext2load mmc 0:2 0xa0000000 dpl-eth.0x2A_0x41.dtb
erase 0x584d00000 +$filesize
cp.b 0xa0000000 0x584d00000 $filesize
```

2. Ovs-dpdk Basic Switching

```
root@localhost:~# ./openvswitch-start.sh
root@localhost:~# ifconfig br0 192.168.1.1
root@localhost:~# ovs-ofctl show br0
OFPT_FEATURES_REPLY (xid=0x2): dpid:0000000000000001
n_tables:254, n_buffers:0
capabilities: FLOW_STATS TABLE_STATS PORT_STATS QUEUE_STATS
ARP_MATCH_IP
actions: output enqueue
set_vlan_vidset_vlan_pcpstrip_vlanmod_dl_srcmod_dl_dstmod_nw_srcmod_nw_dstmod_nw
_tosmod_tp_srcmod_tp_dst
1(dpdk0): addr:00:00:00:00:00:01
config:      0
state:      0
current:    10GB-FD
speed: 10000 Mbpsnow, 0 Mbpsmax
2(dpdk1): addr:00:00:00:00:00:02
3(dpdk2): addr:00:00:00:00:00:03
4(dpdk3): addr:00:00:00:00:00:04
5(dpdk4): addr:00:00:00:00:00:05
6(dpdk5): addr:00:00:00:00:00:06
7(dpdk6): addr:00:00:00:00:00:07
8(dpdk7): addr:00:00:00:00:00:08
LOCAL(br0): addr:00:00:00:00:00:01
OFPT_GET_CONFIG_REPLY (xid=0x4): frags=normal miss_send_len=0
root@localhost:~#
```

```
root@localhost:~# cat openvswitch-start.sh
#!/bin/sh
set -x
```

```

# instantiate 8 dpmac
/usr/local/dpdk/dpaa2/dynamic_dpl.sh dpmac.1 dpmac.2 dpmac.3 dpmac.4 dpmac.5 dpmac.6
dpmac.7 dpmac.8
export DPRC=dprc.2
# kill ovsand config
pkill-9 ovs
rm-rf/usr/local/etc/openvswitch/conf.db
rm-rf/usr/local/var/run/openvswitch/vhost-user1
rm-rf/usr/local/var/run/openvswitch/vhost-user2
# create new ovconfig/database
export OVS_SERVICE_MASK=0x1
export OVS_CORE_MASK=0xfe
export SOCK_MEM=1024
export DB_SOCKET=/usr/local/var/run/openvswitch/db.sock
mkdir-p /usr/local/etc/openvswitch
mkdir-p /var/log/openvswitch
mkdir-p /usr/local/var/run/openvswitch
ovsdb-tool create
/usr/local/etc/openvswitch/conf.db/usr/local/share/openvswitch/vswitch.ovsschema
ovsdb-server --remote=punix:/usr/local/var/run/openvswitch/db.sock\
--remote=db:Open_vSwitch,Open_vSwitch,manager_options\
--pidfile--detach --log-file=/var/log/openvswitch/ovs-vswitchd.log
ovs-vsctl--no-wait set Open_vSwitch. other_config:dpdk-init=true
ovs-vsctl--no-wait set Open_vSwitch. other_config:dpdk-socket-mem="$SOCK_MEM"
ovs-vsctl--no-wait set Open_vSwitch. other_config:dpdk-lcore-mask=$OVS_SERVICE_MASK
ovs-vsctl--no-wait set Open_vSwitch. other_config:pmd-cpu-mask=$OVS_CORE_MASK
ovs-vswitchdunix:$DB_SOCKET --pidfile--detach -c $OVS_CORE_MASK
ovs-vsctladd-brbr0 --set bridge br0 datapath_type=netdev
ovs-vsctladd-port br0 dpdk0 --set Interface dpdk0 type=dpdkoptions:dpdk-devargs=dpni.0
ovs-vsctladd-port br0 dpdk1 --set Interface dpdk1 type=dpdkoptions:dpdk-devargs=dpni.1
ovs-vsctladd-port br0 dpdk2 --set Interface dpdk2 type=dpdkoptions:dpdk-devargs=dpni.2
ovs-vsctladd-port br0 dpdk3 --set Interface dpdk3 type=dpdkoptions:dpdk-devargs=dpni.3
ovs-vsctladd-port br0 dpdk4 --set Interface dpdk4 type=dpdkoptions:dpdk-devargs=dpni.4
ovs-vsctladd-port br0 dpdk5 --set Interface dpdk5 type=dpdkoptions:dpdk-devargs=dpni.5
ovs-vsctladd-port br0 dpdk6 --set Interface dpdk6 type=dpdkoptions:dpdk-devargs=dpni.6
ovs-vsctladd-port br0 dpdk7 --set Interface dpdk7 type=dpdkoptions:dpdk-devargs=dpni.7

```

Use OVS-DPDK as basic L2 switch

```

Board 1
$ls-addni dpmac.1
$ifconfig eth0 192.168.1.100
$iperf3 -s &
$ping 192.168.1.1
$ping 192.168.1.101

```

```
$iperf3 -c 192.168.1.1
```

Board 2:

```
$ls-addni dpmac.2
```

```
$ip netns add ns1
```

```
$ip link set dev eth1 netns ns1
```

```
$ip netns exec ns1 ifconfig eth1 192.168.1.101
```

```
$ip netns execns1 iperf3 -s &
```

```
$ip netns execns1 iperf3 -c 192.168.1.100
```

```
root@localhost:~# ip netns exec ns1 iperf3 -c 192.168.1.100
```

```
Connecting to host 192.168.1.100, port 5201
```

```
[ 4] local 192.168.1.101 port 49976 connected to 192.168.1.100 port 5201
```

[ID]	Interval	Transfer	Bandwidth	RetrCwnd
[4]	0.00-1.00	sec 626 MBytes	5.24 Gbits/sec	2 385 KBytes
[4]	1.00-2.00	sec 626 MBytes	5.25 Gbits/sec	0 399 KBytes
[4]	2.00-3.00	sec 626 MBytes	5.25 Gbits/sec	2 382 KBytes



```
./openvswitch-start.sh
```

```
ifconfigbr0 192.168.1.1
```

```
iperf3 -s &
```

Open vSwitch Base commands:

ovs-vsctl: Used for configuring the ovs-vswitch configuration database (known as ovs-db)

ovs-ofctl: A command line tool for monitoring and administering OpenFlow switches

ovs-dpctl: Used to administer Open vSwitch datapaths

ovs-appctl: Used for querying and controlling Open vSwitch daemons

Flow statistics

```
root@localhost:~/ovs-dpdk# ovs-ofctl dump-flows br0
```

```
cookie=0x0, duration=2.467s, table=0, n_packets=0, n_bytes=0,  
mpls,in_port=dpdk0,mpls_label=200 actions=output:dpdk1 cookie=0x0, duration=15734.710s,  
table=0, n_packets=0, n_bytes=0, priority=0 actions=NORMAL
```

```
root@localhost:~/ovs-dpdk# ovs-appctl bridge/dump-flows br0
```

```
duration=553s, n_packets=0, n_bytes=0, mpls,in_port=1,mpls_label=200,actions=output:2  
duration=16285s, n_packets=0, n_bytes=0, priority=0, actions=NORMAL  
table_id=254, duration=16285s, n_packets=0, n_bytes=0, priority=2,recirc_id=0,actions=drop  
table_id=254, duration=16285s, n_packets=0, n_bytes=0,  
priority=0,reg0=0x1,actions=controller(reason=)  
table_id=254, duration=16285s, n_packets=0, n_bytes=0, priority=0,reg0=0x2,actions=drop  
table_id=254, duration=16285s, n_packets=0, n_bytes=0, priority=0,reg0=0x3,actions=drop
```

Thread/Port statistics

```
# ovs-appctl dpif-netdev/pmd-stats-show
```

```
...
```

```
pmdthread numa_id0 core_id7:
```

```
packets received: 273505260
```

```
packet recirculations: 0
```

```
avg. datapathpasses per packet: 1.00
```

```
emchits: 273505175
```

```
megaflowhits: 84
```

```
avg. subtablelookups per megaflowhit: 1.00
```

```
miss with success upcall: 1
```

```
miss with failed upcall: 0
```

```
avg. packets per output batch: 7.84
```

```
idle cycles: 996022002 (30.25%)
```

```
processing cycles: 2296450049 (69.75%)
```

```
avgcycles per packet: 12.04 (3292472051/273505260)
```

```
avgprocessing cycles per packet: 8.40 (2296450049/273505260)
```

```
root@localhost:~/ovs-dpdk# ovs-ofctl -O OpenFlow14 dump-ports br0
```

```
...
```

```
port dpdk0: rxpkts=562408615, bytes=217089726548, drop=0, errs=22108, frame=?,  
over=?, crc=?
```

```
txpkts=517372700, bytes=199705859978, drop=0, errs=0, coll=?
```

```
duration=218.166s
```

CUSTOM Statistics

```
rx_missed_errors=0, rx_errors=22108, tx_errors=0,
```

```
rx_mbuf_allocation_errors=0,
```

```
root@localhost:~# ovs-appctl dpif-netdev/pmd-rxq-show
```

```

pmdthread numa_id0 core_id1:
isolated : false
port: dpdk0          queue-id: 0    pmdusage: 85 %
pmdthread numa_id0 core_id2:
isolated : false
port: dpdk6          queue-id: 0    pmdusage: 0 %
port: dpdk7          queue-id: 0    pmdusage: 0 %
pmdthread numa_id0 core_id3:
isolated : false
port: dpdk4          queue-id: 0    pmdusage: 11 %
pmdthread numa_id0 core_id4:
isolated : false
port: dpdk2          queue-id: 0    pmdusage: 83 %
pmdthread numa_id0 core_id5:
isolated : false
port: dpdk5          queue-id: 0    pmdusage: 0 %
pmdthread numa_id0 core_id6:
isolated : false
port: dpdk3          queue-id: 0    pmdusage: 0 %
pmdthread numa_id0 core_id7:
isolated : false
port: dpdk1          queue-id: 0    pmdusage: 85 %

```

3. Ovs-dpdk MPLS (MultiProtocol Label) Pop_mpls Example

Build Kernel wit MPLS config

```

git clone https://source.codeaurora.org/external/qoriq/qoriq-components/linux -b linux-4.14
--single-branch
cd linux
git checkout -b LSDK-18.09-V4.14 tags/LSDK-18.09-V4.14
make defconfig lsdk.config
make -j 8
make install
make modules_install

```

```

cp/boot/Image /boot/Image.sav
cp./arch/arm64/boot/Image /boot

```

Have to edit .config and add CONFIG_LWTUNNEL=y, CONFIG_MPLS_IPTUNNEL=y

MPLS termination:

```

ls-addni dpmac.1
ifconfig eth0 192.168.1.100
ip route add 192.168.20.0/24 encap mpls 200 via inet 192.168.1.1 dev eth0

```

```
ifconfig eth0:1 192.168.20.100
ping 192.168.20.20
```

```
./openvswitch-start.sh
ifconfigbr0 192.168.1.1
ifconfigbr0:1 192.168.20.1
```

```
ovs-ofctladd-flow br0
n_port=dpdk0,dl_type=0x8847,mpls_label=200,actions=pop_mpls:0x0800,output:br0
```

Before pop_mpls in ovs

```
14:46:32.173864 IP 192.168.20.1 > linux: ICMP echoreply, id 3816, seq6, length64
64 bytes from 192.168.20.1: icmp_seq=6 ttl=64 time=0.187 ms
14:46:32.333656 ARP, Requestwho-has 192.168.1.1 tell linux, length28
14:46:32.333819 ARP, Reply192.168.1.1 is-at be:19:bc:7b:fb:4f (oui Unknown), length46
14:46:33.197729 MPLS (label 200, exp0, [S], ttl64) IP linux > 192.168.20.1: ICMP echo
request, id 3816, seq7, leng
```

After pop_mpls in ovs
Ping reply is received back

MPLS switching configuration:

Board 1:

```
ls-addni dpmac.1
ifconfig eth0 192.168.1.100
ip route add 192.168.20.0/24 encap mpls 200 via inet 192.168.1.1 dev eth0
ifconfig eth0:1 192.168.20.100
```

Board 2:

```
ls-addni dpmac.2
ip netns add ns1
ip link set dev eth1 netns ns1
ip netns exec ns1 ifconfig eth1 192.168.20.20
ip netns exec ns1 iperf3 -s &
ip netns exec ns1 iperf3 -c 192.168.1.100
```

```
./openvswitch-start.sh
Ifconfig br0 192.168.1.1
ovs-ofctl add-flow br0
in_port=dpdk0,dl_type=0x8847,mpls_label=200,actions=pop_mpls:0x0800,output:dpdk1
ovs-ofctldel-flows br0
ovs-ofctladd-flow br0 in_port=dpdk0,dl_type=0x8847,mpls_label=200,actions=output:dpdk1
```

Before pop_mpls or match mpls in ovs

```
root@localhost:~# tcpdump -i br0
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on br0, link-type EN10MB (Ethernet), capture size 262144 bytes
13:21:09.033967 ARP, Request who-has linux tell 192.168.1.100, length 46
13:21:09.033998 ARP, Reply linuxis-at 76:aa:6c:32:d7:48 (ouiUnknown), length 28
13:21:09.035921 MPLS (label 200, exp0, [S], ttl64) IP 192.168.1.100 > 192.168.20.20: ICMP
echo request, id 4008, seq1, length 64
```

After pop_mpls in ovs

```
root@localhost:~# ip netns exec ns1 tcpdump -i eth1
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on eth1, link-type EN10MB (Ethernet), capture size 262144 bytes
13:27:47.297317 IP6 fe80::e412:e2ff:fe4e:e055 > ip6-allrouters: ICMP6, router solicitation,
length 16
13:27:53.633264 IP 192.168.1.100 > 192.168.20.20: ICMP echo request, id 4069, seq92,
length 64
13:27:54.657252 IP 192.168.1.100 > 192.168.20.20: ICMP echo request, id 4069, seq93,
length 64
```

After matching_mpls in ovs

```
14:06:51.472954 MPLS (label 200, exp0, [S], ttl64) IP 192.168.1.100 > 192.168. seq138,
length 64
14:06:52.496980 MPLS (label 200, exp0, [S], ttl64) IP 192.168.1.100 > 192.168.
```

```
./openvswitch-start.sh
Ifconfig br0 192.168.1.1
ovs-ofctl add-flow br0
in_port=dpdk0,dl_type=0x8847,mpls_label=200,actions=pop_mpls:0x0800,output:dpdk1
ovs-ofctl del-flows br0
ovs-ofctl add-flow br0 in_port=dpdk0, dl_type=0x8847,mpls_label=200,actions=output:dpdk1
```

4. DPDK PACKETGEN

Native dpdk compile

```
cd ..
git clone https://source.codeaurora.org/external/qoriq/qoriq-components/dpdk
cd dpdk
git checkout -b LSDK-18.09 tags/LSDK-18.09
```

refer to:

nxp/README

```
export RTE_KERNELDIR="/root/linux"
export CROSS=""
```



```
export OPENSSL_PATH=/usr/local
nxp/build_dpdk.sh -help
nxp/build_dpdk.sh -p dpaa2 -c -j 8
ln -s build_arm64-dpaa2_static/arm64-dpaa2-linuxapp-gcc/ arm64-dpaa2-linuxapp-gcc
```

Note:

starts x86 compil witherror. Not an issue.

```
Native dpdk pktgen compile
apt-get install libpcap-dev
git clone http://dpdk.org/git/apps/pktgen-dpdk
cd pktgen-dpdk
git checkout -b pktgen-3.4.8 pktgen-3.4.8
export RTE_TARGET=arm64-dpaa2-linuxapp-gcc
export RTE_SDK="/root/dpdk"
make
```

3 Port, 1 Core each

```
/usr/local/dpdk/dpaa2/dynamic_dpl.sh dpmac.1 dpmac.2 dpmac.3 dpmac.4 dpmac.5 dpmac.6
dpmac.7 dpmac.8
export DPRC=dprc.2
./app/arm64-dpaa2-linuxapp-gcc/pktgen -l 0-3 -n 1 --proc-type auto --file-prefix pg --log-level 8
-- -T -P -m "[1].0, [2].1, [3].2"
```

Pktgen-dpdk getting start

```
root@localhost:~/pktgen-dpdk# cat ~/pktgen.sh
#!/bin/sh
set -x
export DPBP_COUNT=32
/usr/local/dpdk/dpaa2/dynamic_dpl.sh dpmac.1 dpmac.2\
dpmac.3 dpmac.4 dpmac.5 dpmac.6 dpmac.7 dpmac.8
export DPRC=dprc.2
cd /root/pktgen-dpdk
./app/arm64-dpaa2-linuxapp-gcc/pktgen-l 0-6 -n 1\
--proc-type auto --file-prefix pg--log-level 8\
--T -P -m "[1].0, [2].1, [3].2, [4].3, [5].4, [6].5"
```

Ovs-dpdk port bridging

LS2088ARDB

```
./pktgen.sh
```

```
Pktgen:/>
```

```
set 0 proto udp
```

```
set 1 proto udp
```

```
set 2 proto udp
```

```
set 0 size 390
set 1 size 390
set 2 size 390
start 0
start 1
start 2
```

```
./openvswitch-start.sh
ifconfigbr0 192.168.1.1
ovs-ofctladd-flow br0 in_port=dpdk0,action=output:dpdk1
ovs-ofctladd-flow br0 in_port=dpdk1,action=output:dpdk2
ovs-ofctladd-flow br0 in_port=dpdk2,action=output:dpdk0
```

Ovs-dpdk mpls matching

board1:

Before match_mpls in ovs

```
14:15:43.185899 4e:1e:b9:cb:80:49 > 76:45:44:6b:69:41, ether type MPLS unicast (0x8847), length
386: MPLS (label 29, exp5, [S], ttl255) 192.168.0.1.1234 > 192.168.1.1.5678: UDP, length 340
```

```
0x0000: 0001 dbff4500 0170 061e 0000 0411 2d0d
```

```
0x0010: c0a8 0001 c0a8 0101 04d2 162e 015c 3913
```

```
0x0020: 6f70 7172 7374 7576 7778 797a 3031 3233
```

```
0x0030: 3435 6162 6364 6566 6768 696a 6b6c 6d6e
```

```
./pktgen.sh
```

```
Pktgen:/>
```

```
set 0 proto udp
```

```
set 1 proto udp
```

```
set 2 proto udp
```

```
set 0 size 390
```

```
set 1 size 390
```

```
set 2 size 390
```

```
enable 0 mpls
```

```
enable 1 mpls
```

```
enable 2 mpls
```

```
range 0 mplsentry 0x0001dbff
```

```
range 1 mplsentry 0x0001dbff
```

```
range 2 mplsentry 0x0001dbff
```

```
start 0
```

```
start 1
```

```
./openvswitch-start.sh
```

```
ifconfigbr0 192.168.1.1
```

```
ovs-ofctladd-flow br0 in_port=dpdk0,dl_type=0x8847,mpls_label=29,actions=output:dpdk1
```

```
ovs-ofctladd-flow br0 in_port=dpdk1,dl_type=0x8847,mpls_label=29,actions=output:dpdk2
```

```
ovs-ofctladdd-flow br0 in_port=dpmac2,dl_type=0x8847,mpls_label=29,actions=output:dpmac0
```

Open vSwitch Using High Performance(PEB) Buffer

```
/usr/local/dpdk/dpaa2/dynamic_dpl.sh dpmac.1 dpmac.2 dpmac.3 dpmac.4 dpmac.5 dpmac.6  
dpmac.7 dpmac.8
```

```
parent -dprc.1
```

```
Creating Non nested DPRC
```

```
NEW DPRCs
```

```
dprc.1
```

```
dprc.2
```

```
Using board type as 2088
```

Using High Performance Buffers

```
mkdir: cannot create directory '/mnt/hugepages': File exists
```

```
##### Container [0;32m dprc.2 [0m is created #####
```

```
Container dprc.2 have following resources :=>
```

```
* 1 DPMCP
```

```
* 16 DPBP
```

```
* 8 DPCON
```

```
* 8 DPSECI
```

```
* 8 DPNI
```

```
* 18 DPIO
```

```
* 2 DPCI
```

```
* 2 DPDMAI
```

```
....
```

```
root@localhost:~# restool dpni info dpni.0
```

```
dpniverison: 7.7
```

```
dpniid: 0
```

```
plugged state: plugged
```

```
endpoint state: 1
```

```
endpoint: dpmac.1, link is up
```

```
link status: 1 -up
```

```
mac address: 16:e3:ec:d7:3b:d8
```

```
dpni_attr.optionsvalue is: 0x10
```

```
DPNI_OPT_HAS_KEY_MASKING
```

```
num_queues: 8
```

```
num_rx_tcs: 8
```

```
num_tx_tcs: 8
```

```
mac_entries: 16
```

```
vlan_entries: 16
```

```
qos_entries: 64
```

```
fs_entries: 1
```

```
qos_key_size: 24
```

```
fs_key_size: 56
```

ingress_all_frames: 0
ingress_all_bytes: 0
ingress_multicast_frames: 0
ingress_multicast_bytes: 0
ingress_broadcast_frames: 0
ingress_broadcast_bytes: 0
egress_all_frames: 0
egress_all_bytes: 0
egress_multicast_frames: 0
egress_multicast_bytes: 0
egress_broadcast_frames: 0
egress_broadcast_bytes: 0
ingress_filtered_frames: 0
ingress_discarded_frames: 0
ingress_nobuffer_discards: 0
egress_discarded_frames: 0
egress_confirmed_frames: 0

root@localhost:~# restool dpio info dpio.0

dpioversion: 4.2

dpioid: 0

plugged state: plugged

offset of qbmansoftware portal cache-enabled area: 0x20000

offset of qbmansoftware portal cache-inhibited area: 0x4020000

qbmansoftware portal id: 0x2

dpiochannel mode is: DPIO_LOCAL_CHANNEL

number of priorities is: 0x8

root@localhost:~# restool dpmac info dpmac.1

dpmacversion: 4.2

dpmacobject id/portal id: 1

plugged state: plugged

endpoint state: 1

endpoint: dpni.0, link is up

DPMAC link type: DPMAC_LINK_TYPE_FIXED

DPMAC ethernet interface: DPMAC_ETH_IF_XFI

maximum supported rate 10000 Mbps

root@localhost:~# restool dpni info dpni.0

dpniverison: 7.7

dpniid: 0

plugged state: plugged

endpoint state: 1

endpoint: dpmac.1, link is up

link status: 1 -up
mac address: 16:e3:ec:d7:3b:d8
dpni_attr.optionsvalue is: 0x10
DPNI_OPT_HAS_KEY_MASKING
num_queues: 8
num_rx_tcs: 8
num_tx_tcs: 8
mac_entries: 16
vlan_entries: 16
qos_entries: 64
fs_entries: 1
qos_key_size: 24
fs_key_size: 56
...
Cf: restooldpnicreate -help