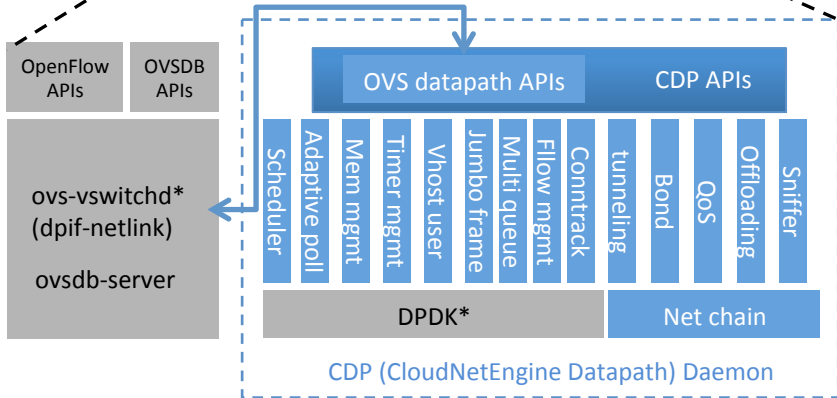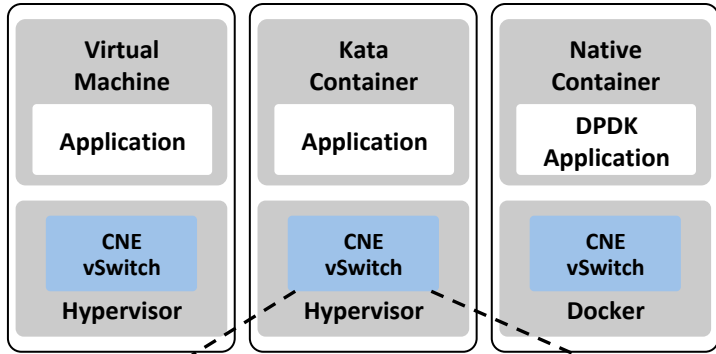# CloudNetEngine vSwitch

The foundation of virtual networks

CLOUDNETENGINE

Product Overview

CloudNetEngine vSwitch provides high performance packet processing for virtual networking in virtual machine, kata container and native container environments.

It doesn't only boost virtual network throughput and latency, but also improve CPU efficiency significantly, meaning you can get much higher VM or container density on your cloud infrastructure to improve ROI.

Product Description and Architecture

CloudNetEngine vSwitch boosts both "NFV" and "Enterprise" network workloads performance by its very unique network stack. The core component is CloudNetEngine datapath which is a standalone user space daemon running on dedicated CPU cores, and it provides all the features to meet various cloud deployment requirements.

For the management and control planes, CloudNetEngine vSwitch uses Open vSwitch as the frontend, so CloudNetEngine vSwitch can be integrated with any SDN solution and Cloud Management Platforms which works with vanilla Open vSwitch.
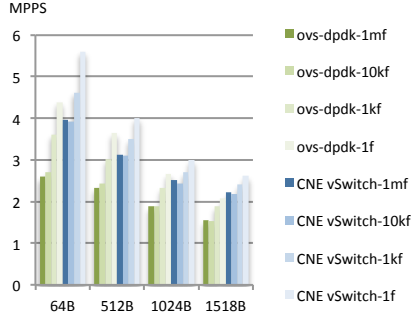
Performance Test Specification

Hardware:
Xeon E5-2620 v3 2.40GHz
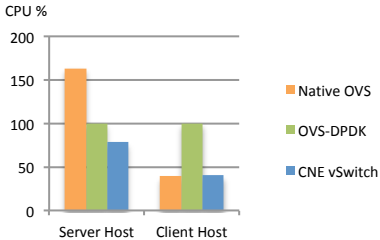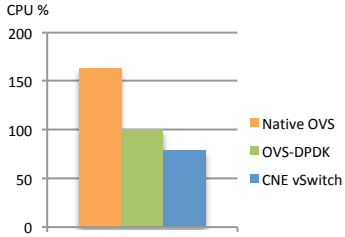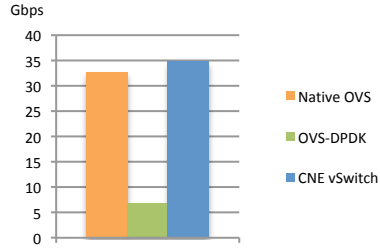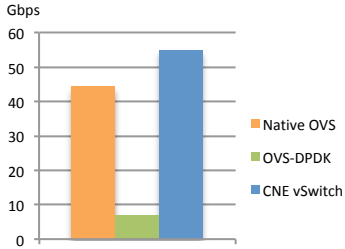Intel XL710 40-Gigabit NIC

Host Software:
Native OVS /OVS-DPDK 2.8.2
CNE vSwitch 2.1
Ubuntu 16.04
Upstream Qemu 2.5.1
TRex 2.0.5 for NFV PVP test

Guest Software:
Buildroot Linux kernel 4.4.3
IPerf 3.1.1
Testpmd io mode fwd for NFV PVP test

MPPS

Legend:
- ovs-dpdk-1mf
- ovs-dpdk-10kf
- ovs-dpdk-1kf
- ovs-dpdk-1f
- CNE vSwitch-1mf
- CNE vSwitch-10kf
- CNE vSwitch-1kf
- CNE vSwitch-1f

NFV PVP 0.01% drop rate test

Gbps

- Native OVS
- OVS-DPDK
- CNE vSwitch

IPerf test on a single host

CPU %

- Native OVS
- OVS-DPDK
- CNE vSwitch

Gbps

- Native OVS
- OVS-DPDK
- CNE vSwitch

CPU %

- Native OVS
- OVS-DPDK
- CNE vSwitch

Server Host   Client Host

IPerf test cross hosts

Note:
Native OVS has done vhost/hw interrupt CPU affinity optimization, otherwise its performance in default configuration degrades a lot.

System Requirements

CPU: Intel 64 with VT-d support
NICs: Intel 10/40 Gbps NICs, i.e.
ixgbe (82598, 82599, X520, X540, X550)
i40e (X710, XL710, X722)
Linux Distributions:
Red Hat Enterprise Linux
Ubuntu
CentOS

Features

Data plane
- High reliability data plane
- NUMA aware RXQ dynamically load balancing among worker threads
- Hybrid RX mode with interrupt + poll
- Pure polling RX mode
- VLAN (802.1Q and QinQ)
- VXLAN, GENEVE, GRE tunneling
- VLAN/QinQ/TSO/UFO/CKSUM SW processing or NIC acceleration
- LRO
- TX zero copy
- Multiqueue
- Conntrack
- NAT
- L3 reassembly
- Physical NIC bonding
- Jumbo Frame

Management/control Plane
- Fully compatible with OVS 2.8.2 for OpenFlow APIs and OVSDB APIs, so it can be seamlessly integrated with ODL, ONOS, OVN etc.
- OVS utilities
- Syslog
- cdp-ctl
- cdp-tcpdump

www.cloudnetengine.com