DPDK

Bridging the gap between hardware functionality in DPDK applications and vendor neutrality in the open source community

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# Proprietary hardware features in open source software – Motivation?

▶ Traditional approaches to hardware appliances in Telco/Enterprise environments are changing.

▶ Open source software projects bring advantages (community maintainability, distribution models, cost savings - lack of commercial licenses) BUT open source projects can be hardware agnostic i.e. Open vSwitch.

▶ Problem: How do developers expose HW proprietary features in this environment?

▶ Answer: ?

Open vSwitch with DPDK deployment environment

- ▶ OpenStack: software platform for cloud computing.

- ▶ Open vSwitch (OVS): multilayer virtual switch.

- ▶ DPDK: set of libraries and drivers for fast packet processing.

- ▶ Hardware : Vendor HW supported in DPDK.

Opensource Communities

OPENSTACK

OVS
OVS-DPDK

DPDK

HW

Feedback
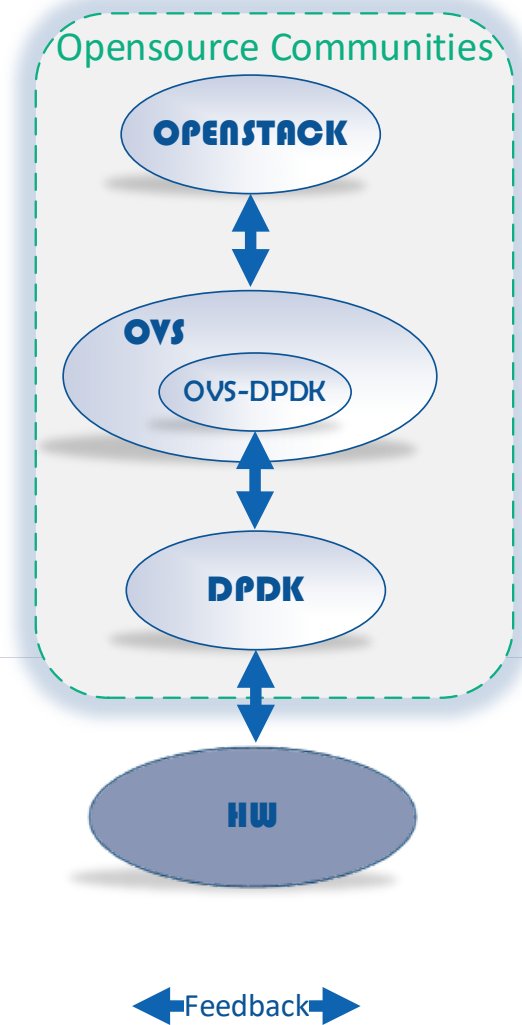
Hardware Acceleration use cases in OVS with DPDK

▶ RX Checksum: Offloading of checksum validation, thus improving the OVS tunneling performance by ~10%. *

❖ Problem: OVS requires extra flags, checksum good, checksum unknown.

▶ Flow director: Improve VXLAN decapsulation performance in OVS by ~70% by using pre-classification in the NIC. **

❖ Problem: Flow director was not exposed in a HW agnostic manner to OVS.

▶ Packet type identification: Optimize the flow extraction process for a packet in OVS can improve throughput by up to ~5%. *

❖ Problem: Different HW implementations of the same feature yield distinct values.

* Test and System Configurations: Estimates are based on internal Intel analysis using Intel® Server Board S2600WT, Intel(R) Xeon(R) CPU E5-2695 v3 @ 2.30GHz, Intel® 82599ES 10 Gigabit Ethernet Controller

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Conclusion

▶ Problem : How do developers expose HW proprietary features in an open source environment?

▶ Answer : Unfortunately there's no silver bullet solution BUT there are BKMs to follow & Pitfalls to avoid:

- Hardware features should be consumable in a HW agnostic manner.

- Early engagement where possible with all communities involved is key.

- Open source communities can have different requirements for the same feature.

- Vendor neutral DPDK applications require a common abstraction for HW features to conform to.

Questions?

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