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

Ian Stokes & Sugesh Chandran
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Proprietary hardware in open source software – Motivation?

Open vSwitch with DPDK deployment environment

Hardware Acceleration use cases in OVS with DPDK

Conclusion
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.
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® Ethernet Converged Network Adapter X710-DA4

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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?

Ian Stokes
ian.stokes@intel.com

Sugesh Chandran
sugesh.chandran@intel.com