OVS Offload with Intel® FM10000

DPDK Summit, Aug. ‘16

Eyal Cohen
Agenda

- Intel® FM10000 NIC Is Unique
- A Walk on the Data Path
- DPDK OVS Benefits
- Benchmark Results
- Roadmap
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Intel® FM10000 NIC Is Unique

- Connectivity – 1G, 10G / 40G, 25G / 100G
- Switch – TCAM, FlexPipe™ (tunneling, VXLAN, filtering)
- Integrated PCIe MAC – SR-IOV
- All in one die

Silicom
Connectivity Solutions

OVS Offload with Intel® FM10000

OvS
Open vSwitch
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A Walk on the Data Path
A Walk on the Data Path (cont.)

OVS Offload with Intel® FM1000
A Walk on the Data Path (cont.)
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DPDK OVS Benefits

- Userspace – Match Interface
  - Predictable core count use
- vhost-user
  - Multiple CPU cores utilization
- SR-IOV and virt-io magical coupling
  - Live migration, etc.
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Benchmark Results

Single VM l2fwd

OVS vs. DPDK-OVS

DPDK OVS

OVS

Bandwidth

0
500,000,000
1,000,000,000
1,500,000,000
2,000,000,000
2,500,000,000

OVS Offload with Intel® FM10000
Benchmark Results (cont.)

Single VM I2fwd
Hardware vs. Software

SR-IOV
DPDK
OVS

SR-IOV

DPDK
OVS

OVS

Bandwidth

0
2,000,000,000
4,000,000,000
6,000,000,000
8,000,000,000
10,000,000,000
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Roadmap

- OVS benefits
  - VM L2/L3 networking state (ACL, QoS, SPAN, sFlow) – identifiable and migratable
  - VXLAN, NVGRE
  - Multi host device
- Why FM10K
  - Because it can assist with OVS’s whys
- DPIF, Netdev, ofproto
Simplicity is the ultimate sophistication

Leonardo da Vinci
Summary

- The SR-IOV catch resolved
- No bottlenecks up to wire speed
- Why not Linux bridge(!)
- Gratitude: Maksim Mihailovich
DPDK and QAT Use Cases

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- An Introduction to QAT
- Use Cases for DPDK and QAT
- Monitoring Use Case In-Depth
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An introduction to QAT

- Symmetric and asymmetric crypto primitives
- HMAC
- Stream compression
Agenda

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Use Cases for DPDK and QAT

- IPSec
- Monitoring (decryption, no TCP termination)
- Storage (compression and decompression)
Agenda

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Monitoring Use Case In Depth

- SSL web traffic renders monitoring systems blind
- MITM is required
- Benefits of DPDK
- Model of integration with QAT
Monitoring Use Case In Depth (cont.)

Host

Stream reconstruction

Application

OpenSSL

TCP

mmap

Crypto Engine

DPDK

pmd

QAT adapter

Eth adapter

DPDK and QAT Use Cases
Monitoring Use Case In Depth (cont.)

- MITM on an Intel® Xeon D QuickAssist adapter
Thank You
Backup Data
Intel® FM10000

- Programmable Intelligent 100G/40/25/10/1 GBE PCI Express Filtering NIC
- Front End Packet Processing offload
- Based on Intel standard controllers and drivers
- Based on Intel Multilayer switches
- Side band management path API to download rules
- The multilayer switch operates at line rate for all packets sizes and conditions
- HW based execution: Drop, Forward, Route, TAP, Police, count, Tag, load balance
- 32K 40b TCAM rules
- Smart NIC / Filtering NIC simplest integration
- Based on standard ASIC, Integrated Switch and NIC
- Cost and power efficient
Thank You