December 10th-11th, 2020 | Virtual, Earth

More Next Steps for Even Higher Performance on the Software Datapath

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Intel

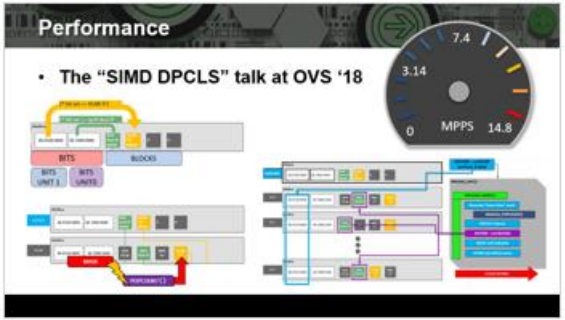
Topics In Todays Video

- **DPIF**
  - Optimizing the glue code of the Userspace Datapath
- **MFEX**
  - Optimizing the packet parsing using AVX512 SIMD instructions

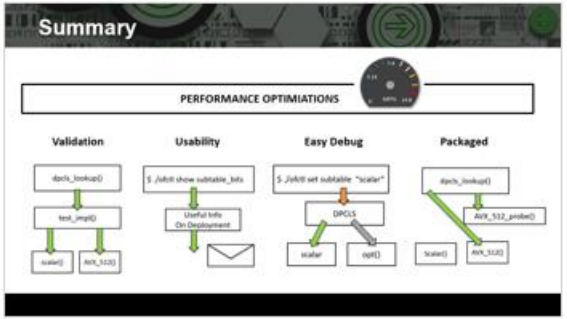
Please note the video explains details not in these slides!

Context - Previous Talks on SW Datapath

- **OVS Conf ’18**
  - Miniflow Datastructure Optimization
  - DPCLS Lookup Optimizations in AVX512
  - https://youtu.be/5-MDlpUIOBE

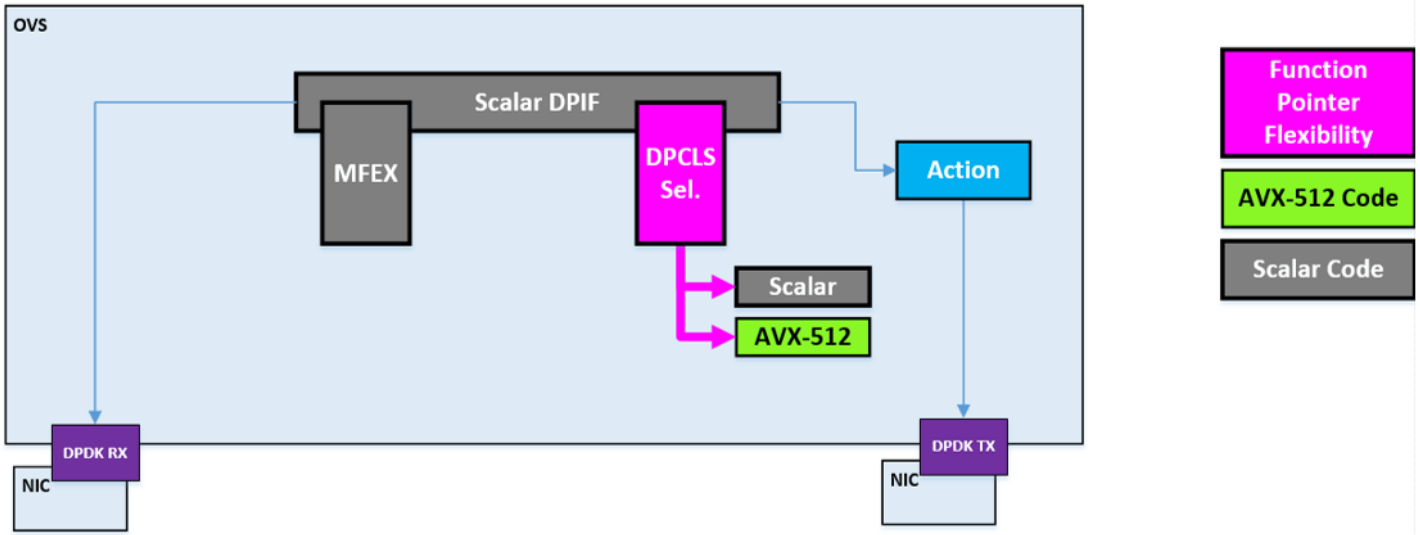


- **OVS Conf ‘19**
  - Testing Validation, and Deployment
  - Packaging with ISA-optimizations
  - https://youtu.be/x0bOpojnpmU

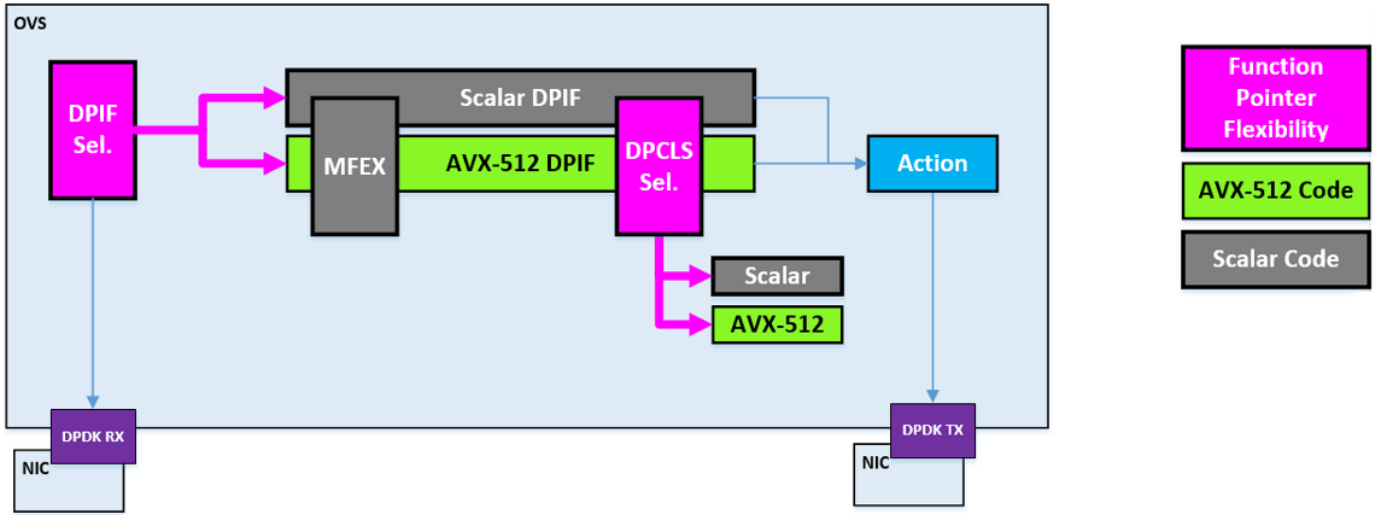


- **DPIF**
  - Optimizing the glue code of the Userspace Datapath

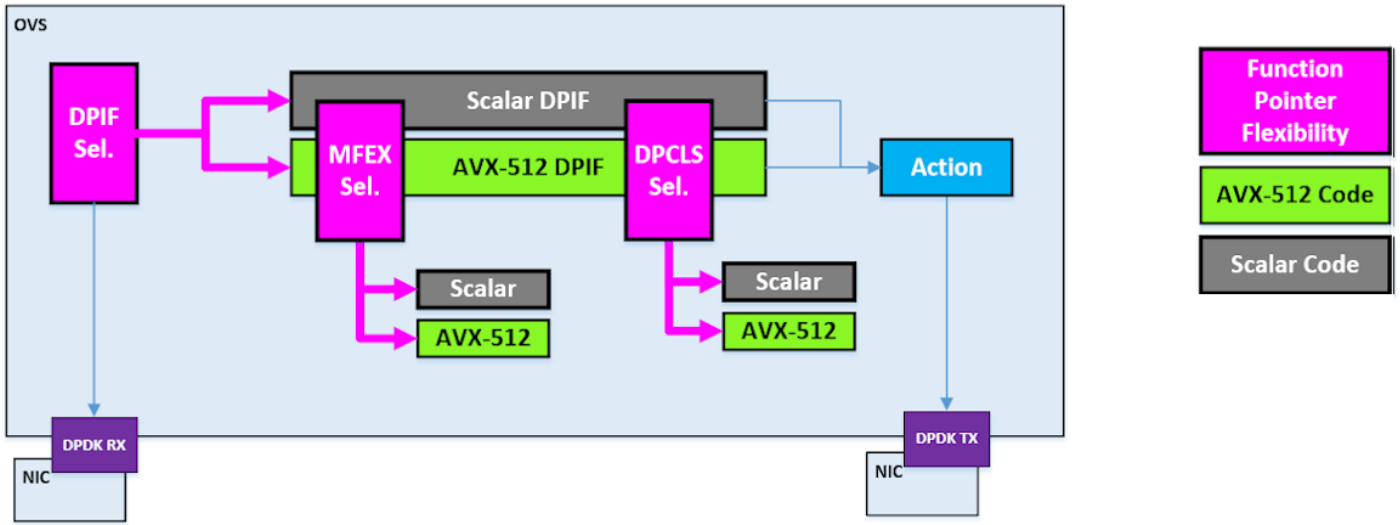
OVS – SW Datapath Today



OVS 2.14 + DPIF


OVS
DPIF Sel.
Scalar DPIF
MFEX
AVX-512 DPIF
DPCLS Sel.
Action
Scalar
AVX-512
DPDK RX
NIC
DPDK TX
NIC
Function Pointer Flexibility
AVX-512 Code
Scalar Code

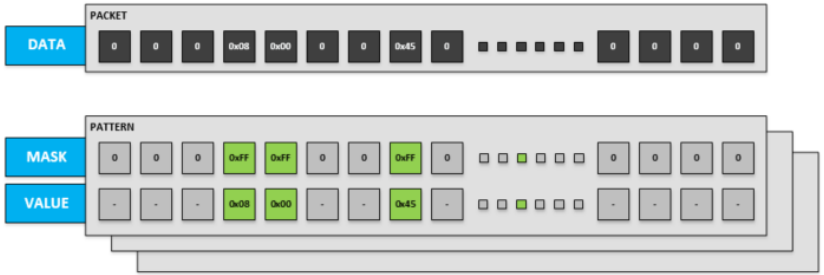
2.14 + DPIF + MFEX

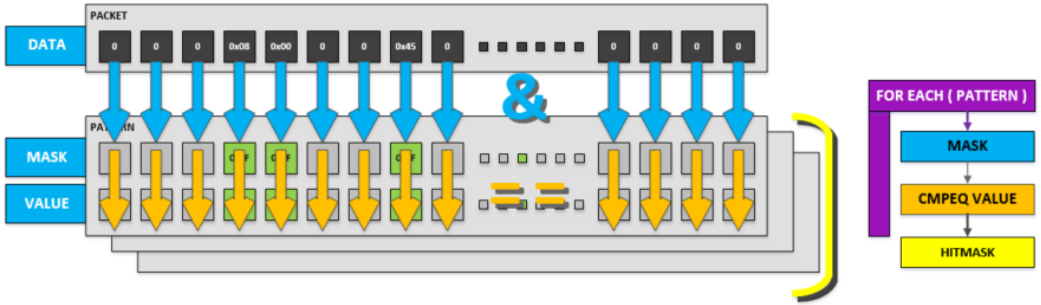


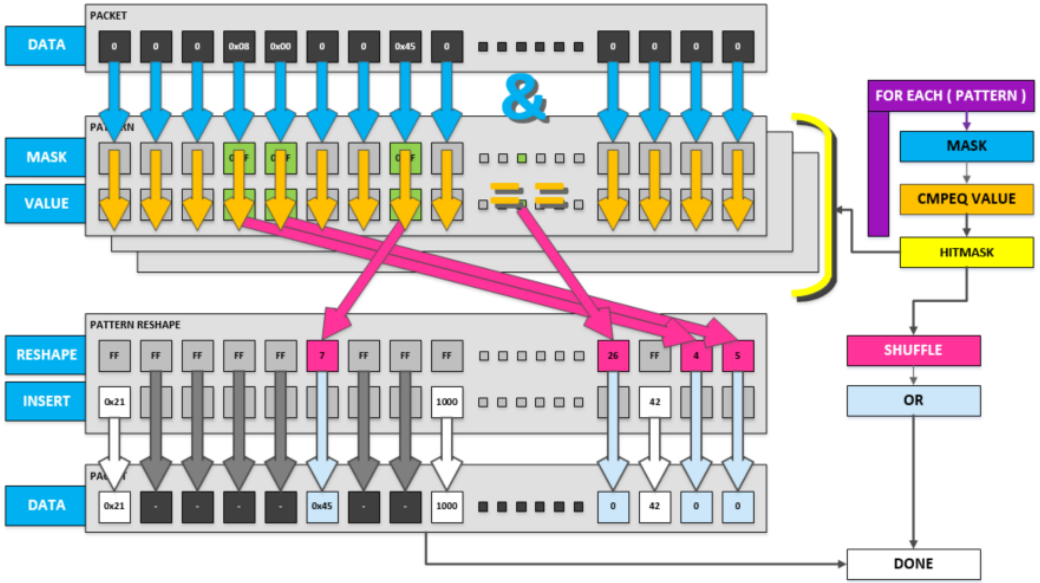
DPIF AVX-512

```
ovs-appctl dpif-netdev/dpif-set dpif_avx512
ovs-appctl dpif-netdev/dpif-set dpif_scalar
```

- **MFEX**
  - Optimizing the glue code of the Userspace Datapath


PACKET
DATA
0
0
0
0x08
0x00
0
0
0x45
0
0
0
0
0
PATTERN
MASK
VALUE
0
0
0
0xFF
0xFF
0
0
0xFF
0
0
0
0
0
-
-
-
0x08
0x00
-
-
0x45
-
-
-
-
-


PACKET
DATA
MASK
VALUE
&
FOR EACH (PATTERN)
MASK
CMPEQ VALUE
HITMASK


PACKET
DATA
MASK
VALUE
PATTERN RESHAPE
RESHAPE
INSERT
DATA
FOR EACH (PATTERN)
MASK
CMPEQ VALUE
HITMASK
SHUFFLE
OR
DONE

Miniflow Extract with AVX512

```
ovs-appctl dpif-netdev/miniflow-optimize avx512
    match_mask=0xFFFF
    match_data=0xf00d
    shuffle_index=0x1,0x4,0x2,0x3
    test_packet=<Ether()/IP()/UDP()>
```

! Thanks !
? Questions ?

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