Next Steps for Software Datapath

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Introduction

- **GOOD** is Higher Performance
- **GREAT** is “Batteries-Included” Experience
Performance

- The “SIMD DPCLS” talk at OVS ‘18
Batteries Included

• **Test & Validation**
  • Minimal Extra Effort per Release
  • Smart Automated Testing

• **Usability & Debug**
  • Users to Check Status
  • Power-Users to Configure

• **Packaged & Deploy**
  • Transparent Acceleration
Test & Validation

• ISA Optimized DPCLS
  • Scalar
  • AVX-512

• Automated Testing
  • DPCLS Function Pointer re-use
  • “Delegator” implementation
  • Tests all other implementations
  • Validates results as Identical
  • Runs with all Unit Tests
DEPLOYED

dpcls_lookup()

scalar()  AVX_512()

TESTING

dpcls_lookup()

test_impl()

scalar()  AVX_512()
• **Easily View Status**
  • Understand Optimizations that are in use
  • Provide Feedback to OVS Community

• **Enable Power-Users to Configure**
  • Reset Optimized Version to Scalar
  • Sometime, Somebody will want this
    – Exact replication of a deployment?
Usability & Debug

User

$ ./ofctl show subtable_bits

Useful Info
On Deployment

Power User

$ ./ofctl set subtable "scalar"

DPCLS

scalar  opt()
Package & Deploy

• Runtime CPU Detection
  • Required to “plug in” ISA-based optimizations

• RFC/Patch v1 on mailing list soon
  • Based on DPDK EAL CPU Detection

• One Binary Runs Everywhere
  • Build process updates
Runtime CPU Detection

**CPU without ISA**

- `dpcls_lookup()`
- `AVX_512_probe()`
- `Scalar()`
- `AVX_512()`

**CPU with ISA**

- `dpcls_lookup()`
- `AVX_512_probe()`
- `Scalar()`
- `AVX_512()`
Summary

PERFORMANCE OPTIMIZATIONS

Validation
- dpcls_lookup()
  - test_impl()
    - scalar()
    - AVX_512()

Usability
- $./ofctl show subtable_bits
  - Useful Info
    - On Deployment

Easy Debug
- $./ofctl set subtable "scalar"
  - DPCLS
    - scalar
    - opt()

Packaged
- dpcls_lookup()
  - AVX_512_probe()
  - Scalar()
  - AVX_512()
! Thanks !

? Questions ?

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