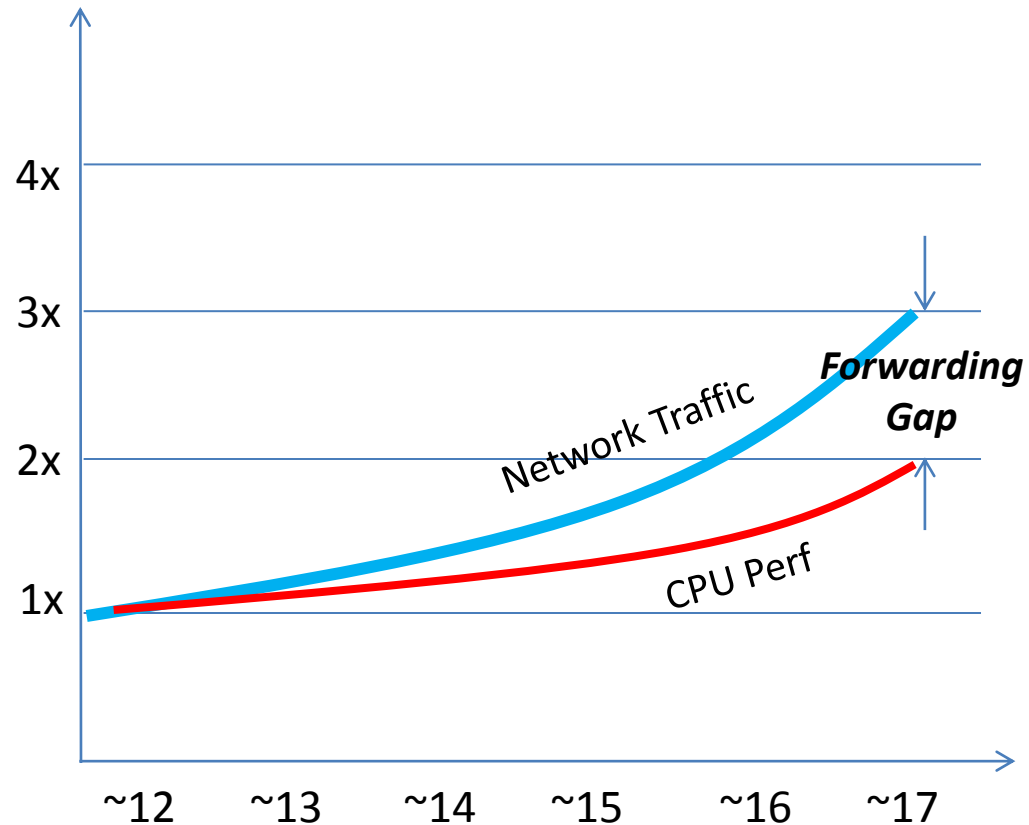# Controlling the Data Path Acceleration Behaviors using ForCES

draft-cao-dataplane-acceleration-framework-01

Zhen Cao

China Mobile

The Matter of Fact

- CAGR of Global Internet Traffic is 24% *
  - Fixed CAGR = 21%
  - Mobile CAGR = 68%

- Chipset performance CAGR is around 14%

- The '***Forwarding Gap***' is therefore formed

* Cisco Visual Networking Index: Forecast and Methodology, 2012–2017
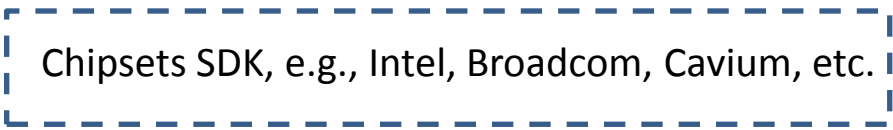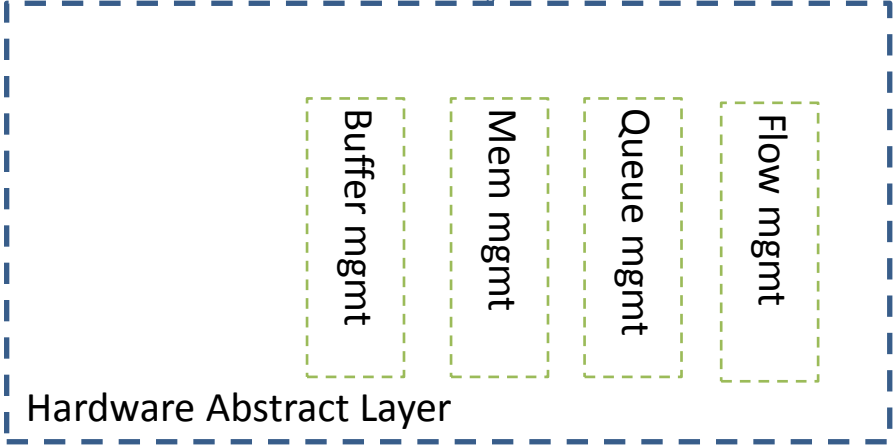
Current practice to cover the 'Forwarding Gap'

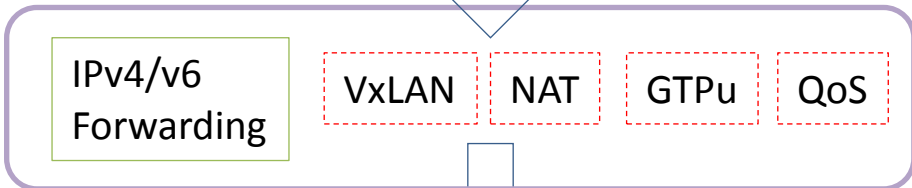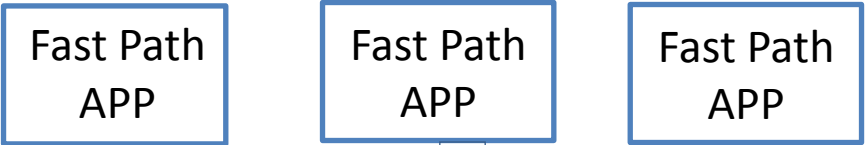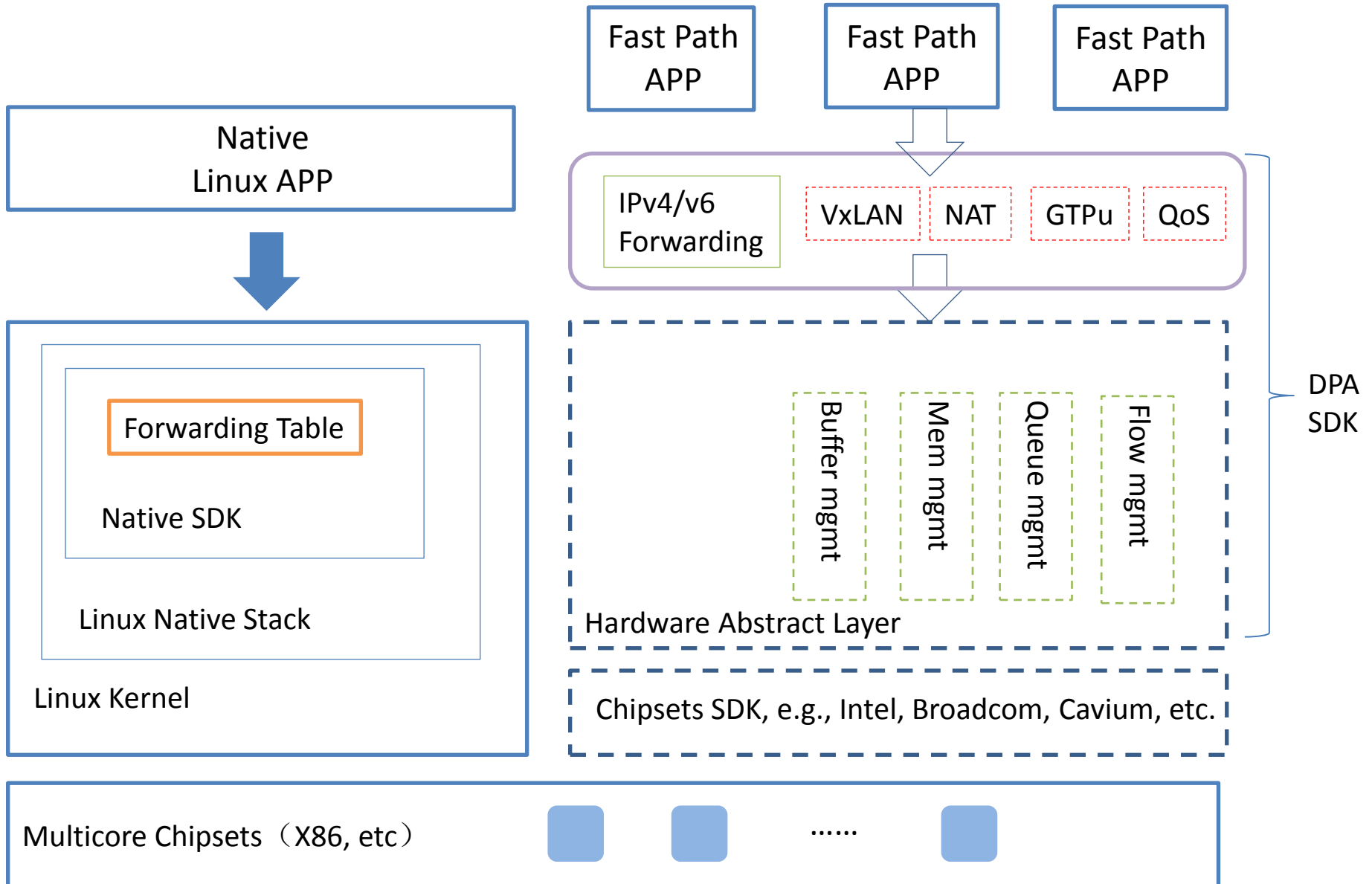- Data Plane Acceleration
  - Data Plane Develop Kit, i.e. DPDK
  - Accelerated virtual switch
  - Open Data Plane project (www.opendataplane.org)

- Tricks – essentially it is to create *'Fast Paths'*
  - Efficient Run-time Memory Allocation, e.g., no malloc
  - Minimize Data Copies in Memory
  - Align data structures for best cache usage
  - Have data at the right place at the right time

Fast Path across devices
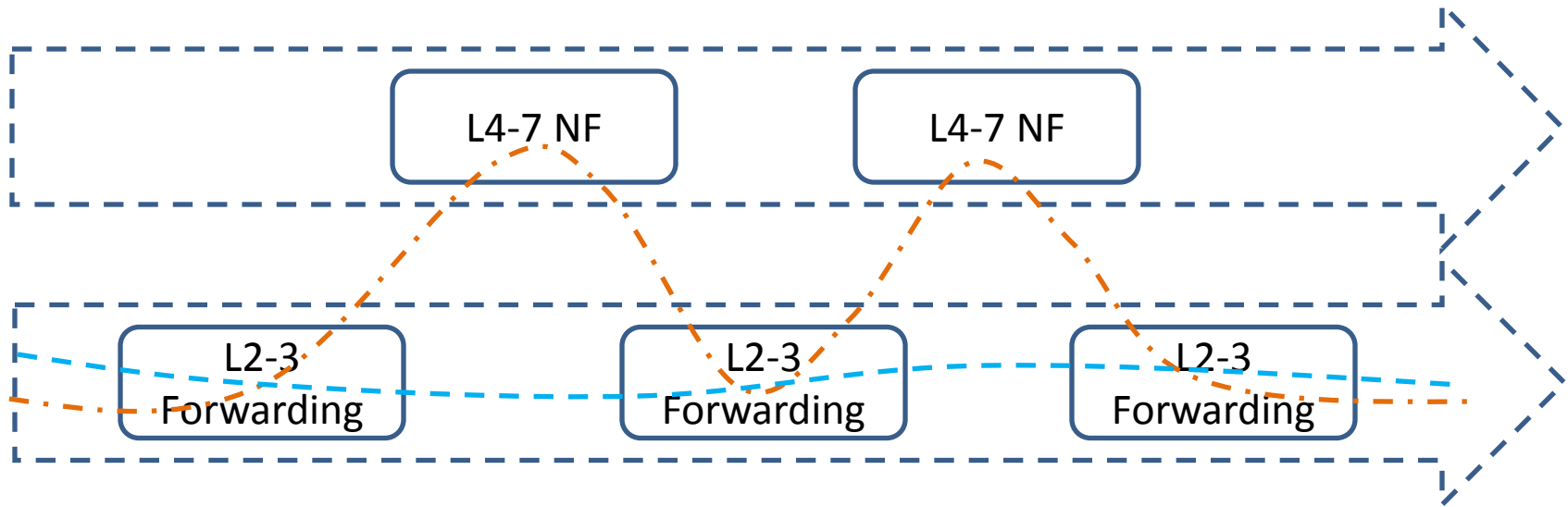
- The higher layer the packet is being processed, the more challenge to its performance
- For some L4-7 network functions, the NF can establish the session and offload the traffic to the L2-3 infrastructure.
- Information (meta-data) conveyed from the NFs to forwarding devices

Current DPA Architecture

Fast Path APP

Fast Path APP

Fast Path APP

Native Linux APP

IPv4/v6 Forwarding

VxLAN | NAT | GTPu | QoS

DPA SDK

Forwarding Table

Native SDK

Linux Native Stack

Linux Kernel

Buffer mgmt | Mem mgmt | Queue mgmt | Flow mgmt

Hardware Abstract Layer

Chipsets SDK, e.g., Intel, Broadcom, Cavium, etc.
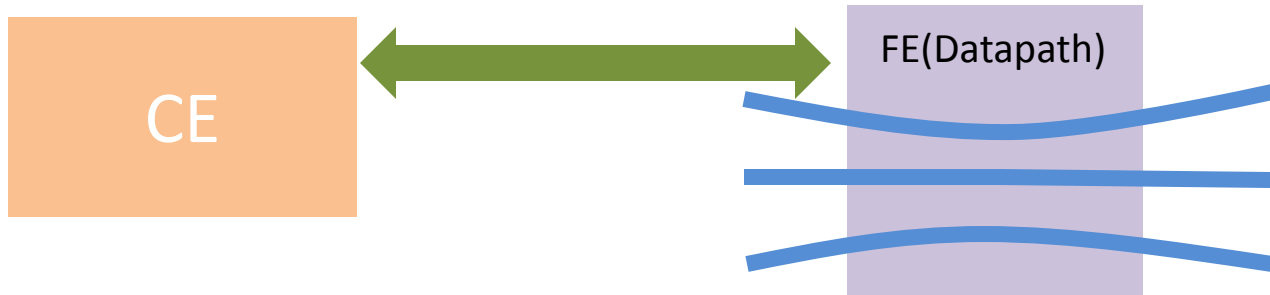
Multicore Chipsets（X86, etc）

......

What's missing?

- DPDK considers the data as a single block, not able to differentiate flows
  - Some flows are not necessarily accelerated
  - Some flows are more important than others
  - Different users have different requirements
- In any case, the data plane need to be informed about such information

Relationships to ForCES

- FE elements to CE
  - Notification of DPA capabilities
  - Notification of the flow identification
  - Notification of chipset information, already there?
- CE elements to FE
  - Configure the FE w.r.t. its DPA behaviors
  - Configure flow priorities on the FE

Virtualization or not ?
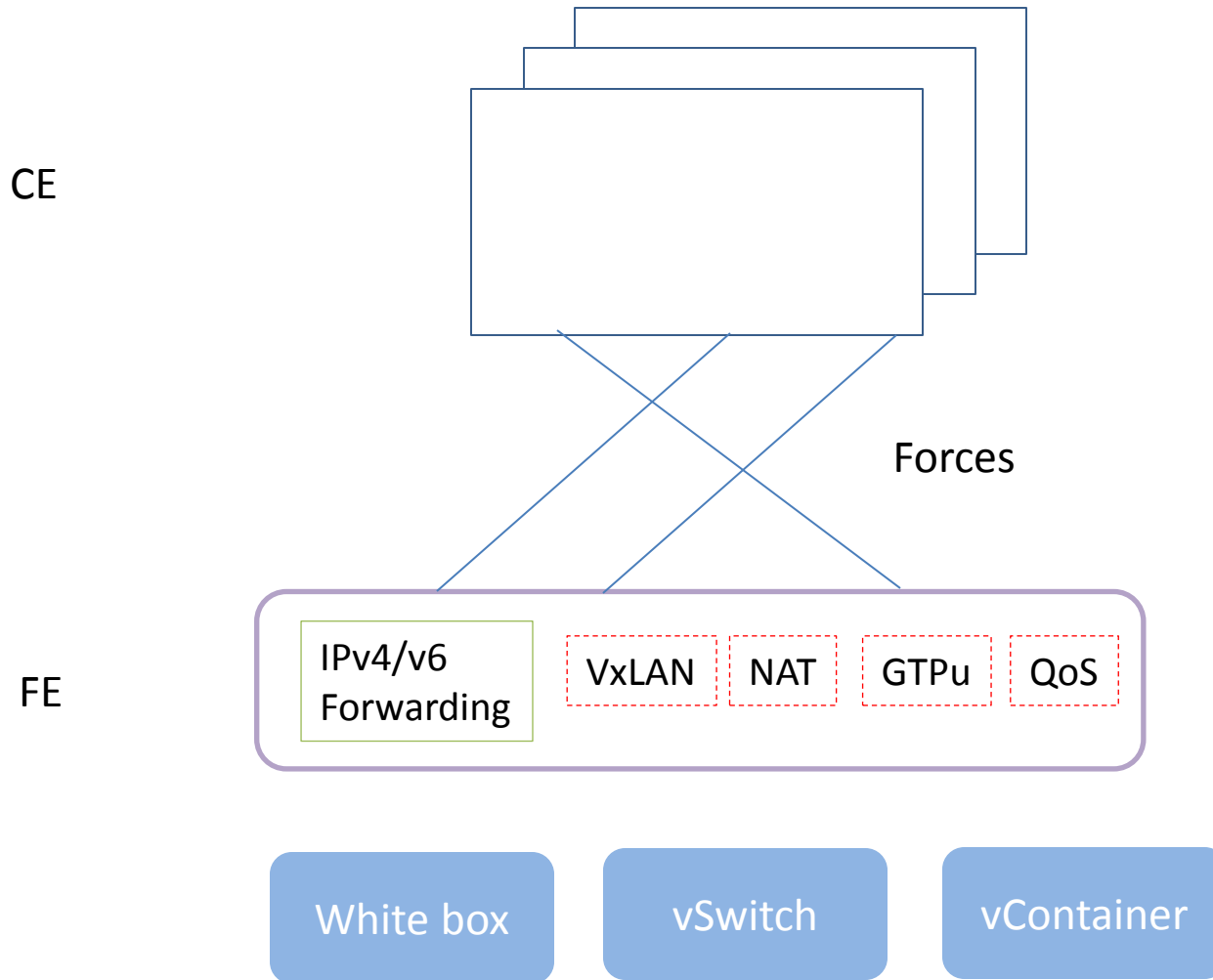
Next Steps?

- Submit a new forces scenario and possibly a solution draft in forces

- Consider this a work group direction?