

# Data Plane Processing Acceleration Framework

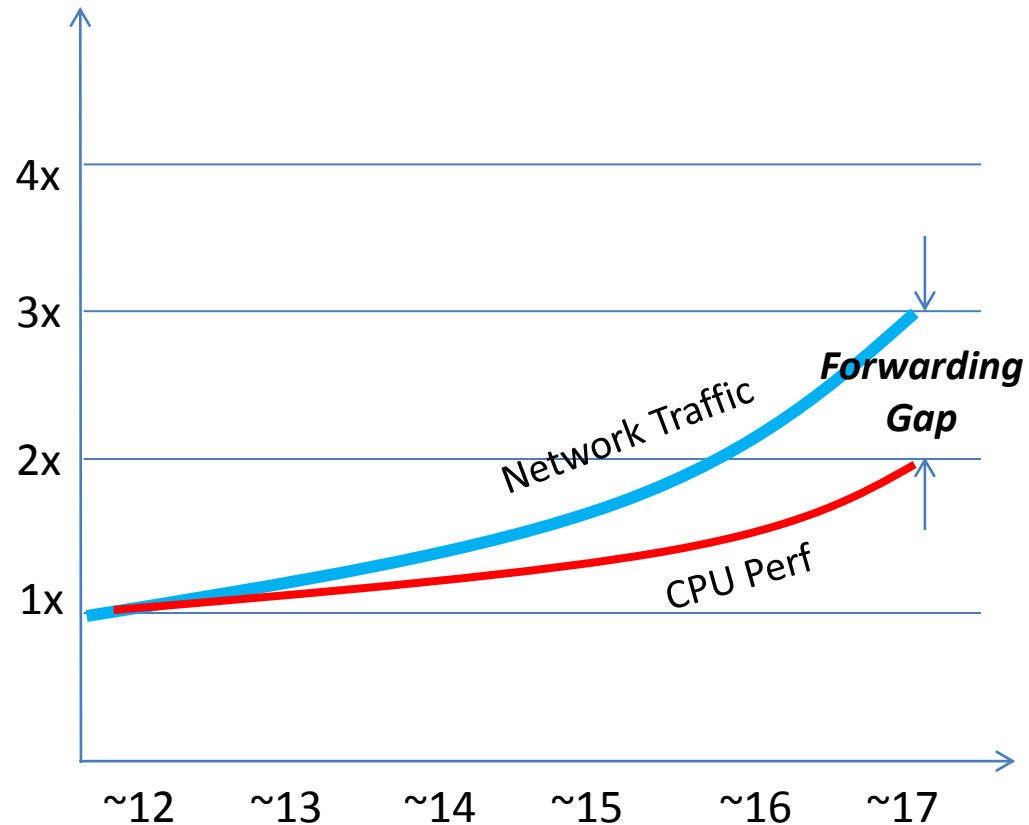
(Focusing on its Impacts to Internet Protocols)

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# The Matter of Fact

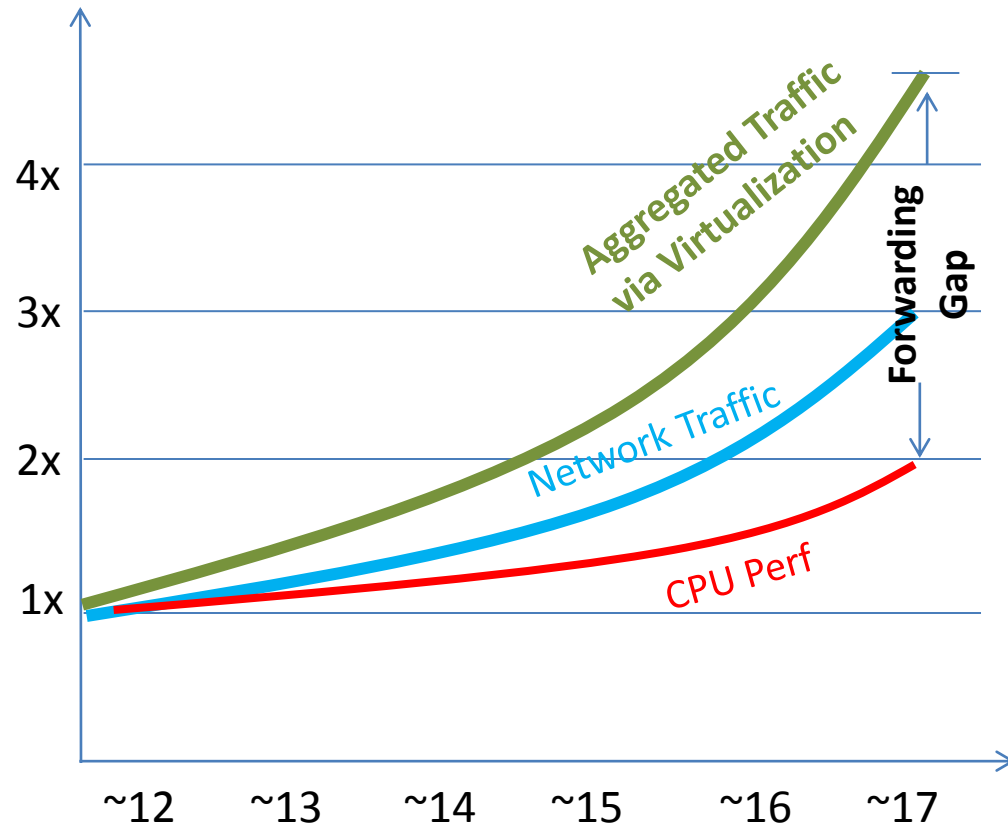
- CAGR of Global Internet Traffic is 24% \*
  - Fixed CAGR = 21%
  - Mobile CAGR = 68%
- Chipset performance CAGR is around 14%
- The '**Forwarding Gap**' is therefore formed



\* Cisco Visual Networking Index: Forecast and Methodology, 2012–2017

# The Matter of Fact, magnified by virtualization

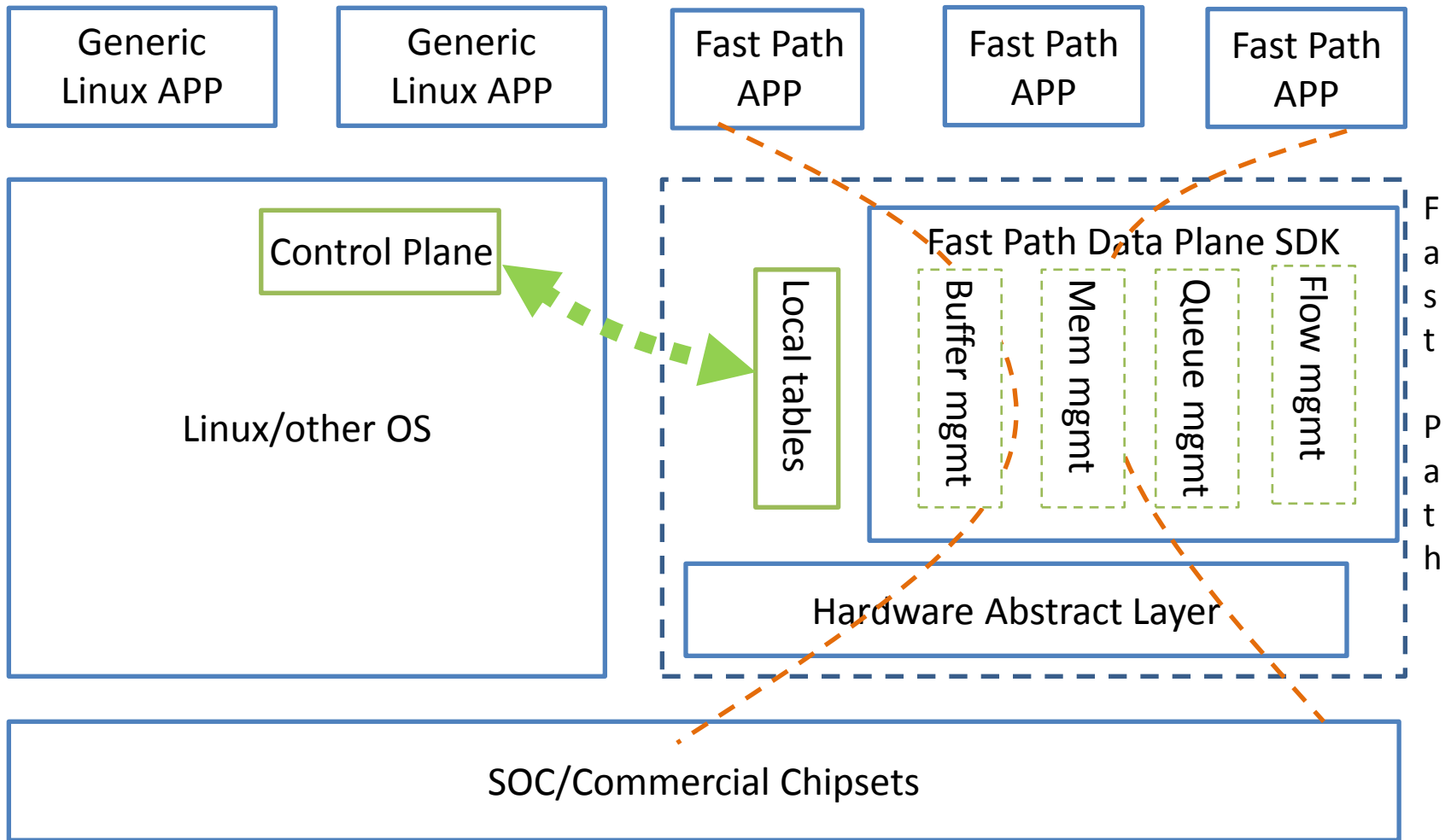
- Virtualization technology increases traffic within appliances
- The 'Forwarding Gap' is therefore magnified



# Current practice to cover the 'Forwarding Gap'

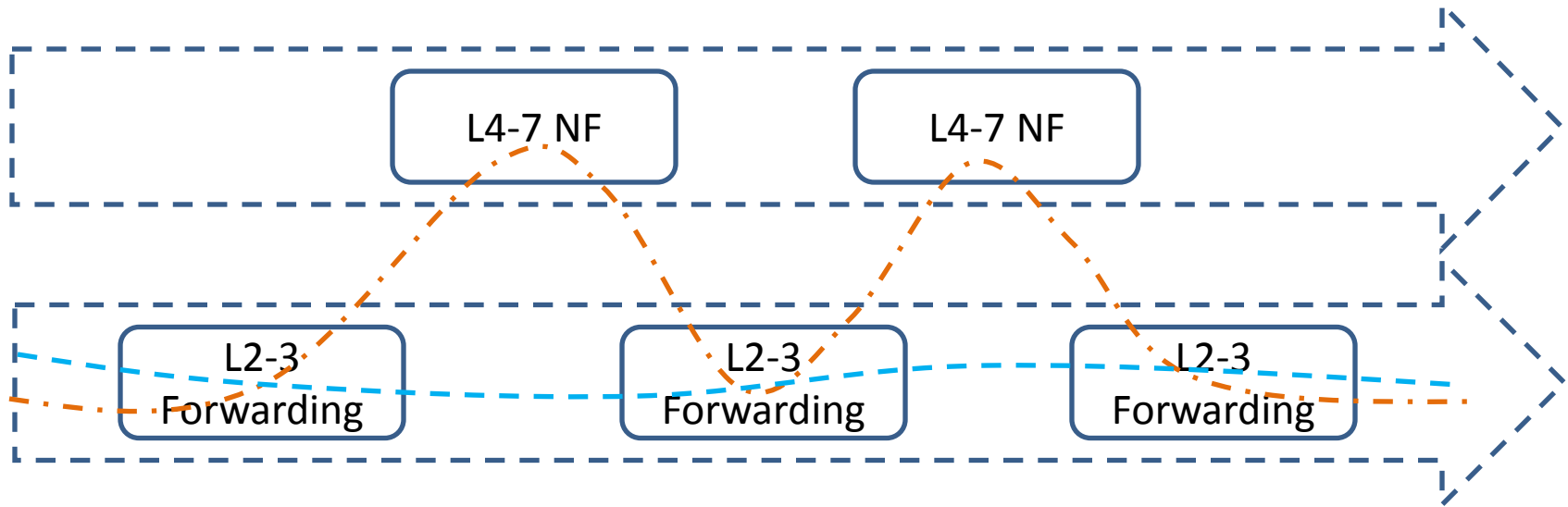
- Data Plane Processing Acceleration
  - Data Plane Develop Kit, i.e. DPDK
  - Accelerated virtual switch
  - Open Data Plane project ([www.opendataplane.org](http://www.opendataplane.org))
- Tricks – essentially it is to create 'Fast Paths'
  - Efficient Run-time Memory Allocation, e.g., no malloc
  - Minimize Data Copies in Memory
  - Align data structures for best cache usage
  - Have data at the right place at the right time

# Fast path within one device





HAL: Separating Data Plane Application Design from Implementation Design

# 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 bare metal forwarding devices

# Relations to IETF STD

	Fast Path within one device	Fast path over multiple devices
Abstract APIs that abstract the buffer/memory/flow/queue management over multiple chipset arch	Doable but not abstract API	North-bound API , depending on the necessity of the below entry
Communication between control and data plane	Wire-invisible (DMS) 	Wire-visible 

# Next Steps?

- Comments welcome
- Interested partners welcome