Data-Intensive Function Acceleration

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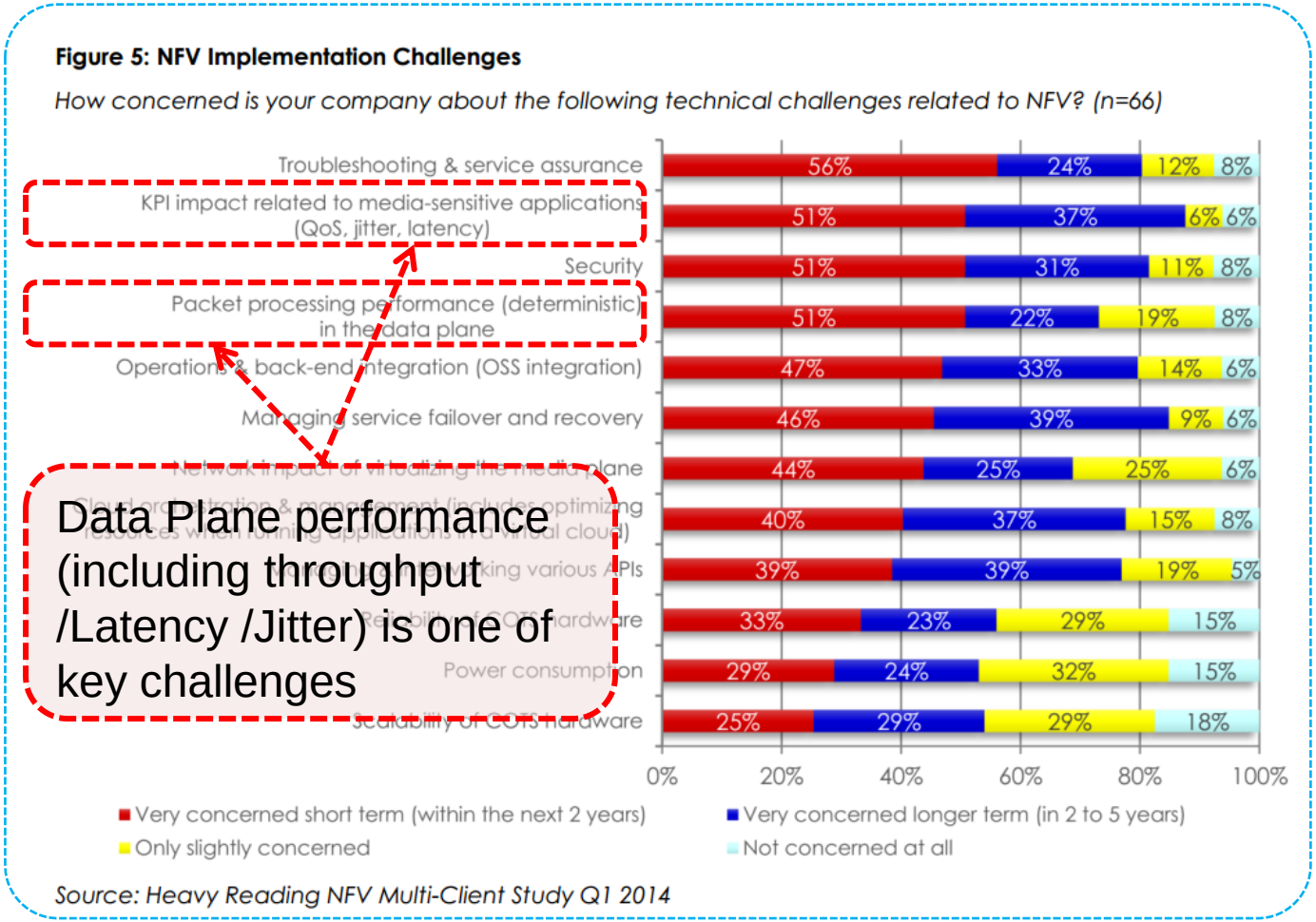
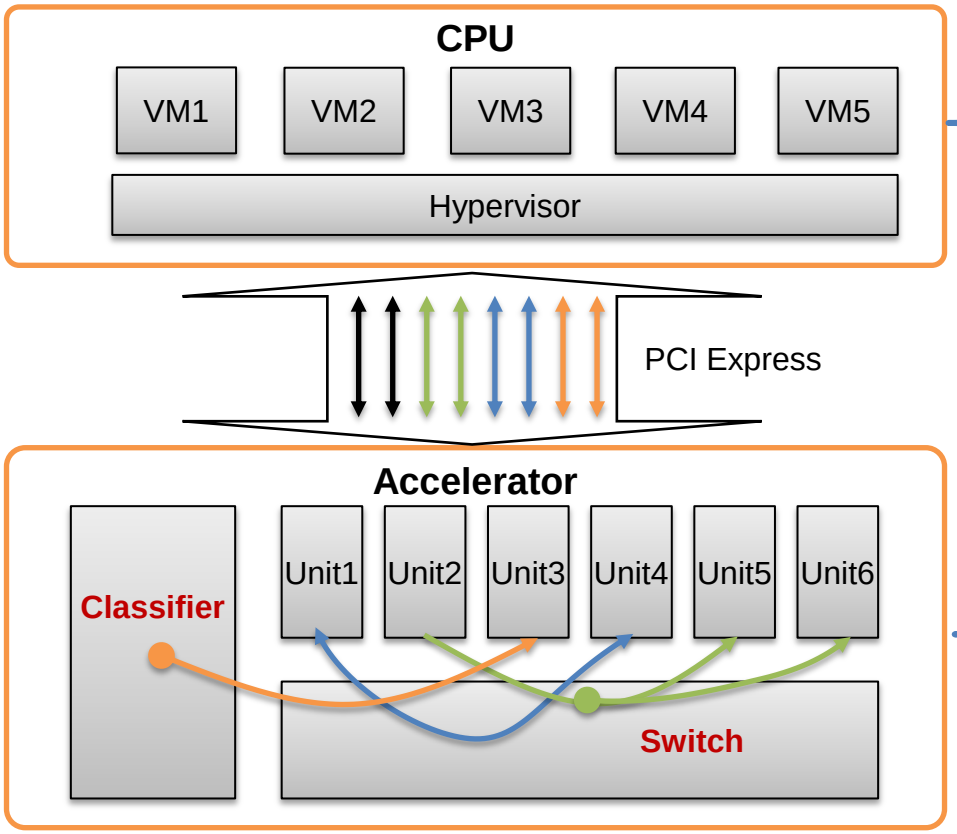
Motivation



- It's challenging to have low-latency and high-performance VNFs in NFV environment.

CPU + Accelerator



- Benefits of X86
  - Flexibility, Rapid Innovation
  - Faster TTM

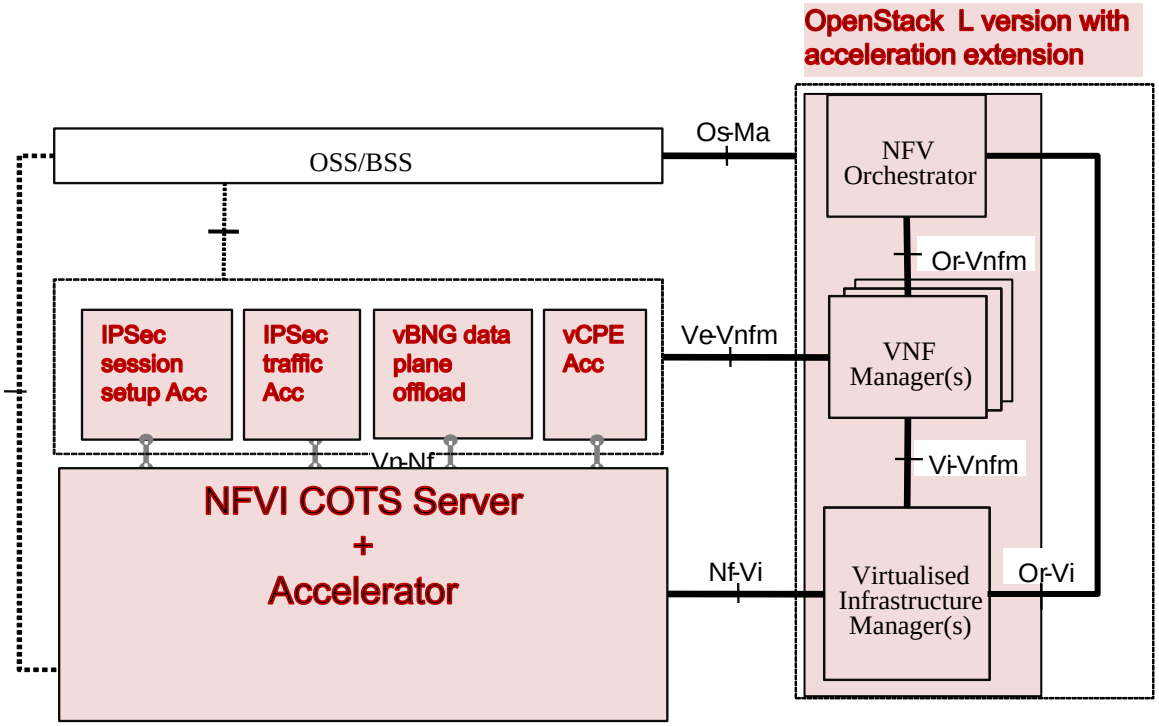
- Benefits of accelerator
  - improve throughput on small packet.
  - decrease latency/Jitter
  - save I/O cycles on X86
  - classify incoming traffic, forward, load-balance and chain flows across VMs
  - accelerate overlay networking, e.g. VxLAN, NVGRE
  - accelerate packet processing, e.g. virtualized L2, L3, NAT

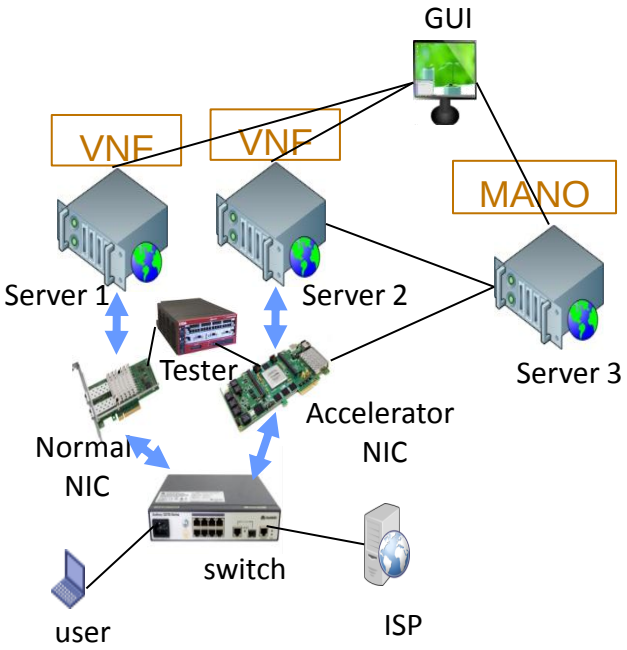
- This should be a way to unite the flexibility of X86 and performance of accelerator.

Standard work in ETSI NFV IFA WG

- Acceleration Interface (IFA018) specifies the interface between data-intensive VNF and accelerator.
  - The interface allows the VNF to offload its data plane processing to the accelerator while keeping its control plane on the VM.
  - VNF instructs accelerator to process packets based on the rules in match-action tables via the following 3 sub-interfaces.
    - Control interface: add/update/query/delete the entries of the forwarding tables. Each entry includes the items such as forwarding table ID, forwarding table name, entry ID, match, action and etc;
    - Operation interface: report statistics and events to the VNF;
    - Packet I/O interface: forward non-accelerated packets and unmatched packets to the VNF;

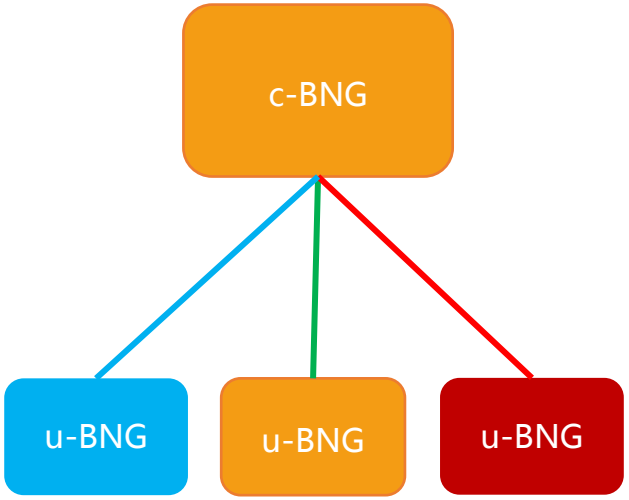
Acceleration PoC





- Acceleration PoC: Data-intensive Function Acceleration
  - Use Cases: IPSec session setup Acc, IPSec traffic Acc, vBNG data plane offload, vCPE (OVS+NSH) offload.
  - Timelines: starts from March 2017, aims to be demonstrated at SDN NFV Congress, The Hague, Netherlands, Oct 2017.

Relevant works in IETF NFV RG



- draft-gu-nfvrg-cloud-bng-architecture-00
  - Defines the architecture of cloud-based BNG devices with centralized control plane (CP) and user plane (UP) separation;
  - Similar to vBNG data plane offload use case in the Acceleration PoC if u-BNG is running on the accelerator;
- draft-huang-nvo3-vxlan-extension-for-vbras-00
  - Describes the VxLAN extension requirements for signaling exchanges between control plane and user plane of virtual BRAS;
- need more auxiliary drafts
  - Problem Statements I-D; Gap Analysis I-D; Requirements I-D; etc;

Make Sense?

More Question?