

An abstract graphic on the left side of the image, composed of numerous thin, light green lines that curve and swirl together to form a large, irregular, organic shape. The lines are more densely packed in some areas, creating a sense of depth and movement.

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OCP
SUMMIT

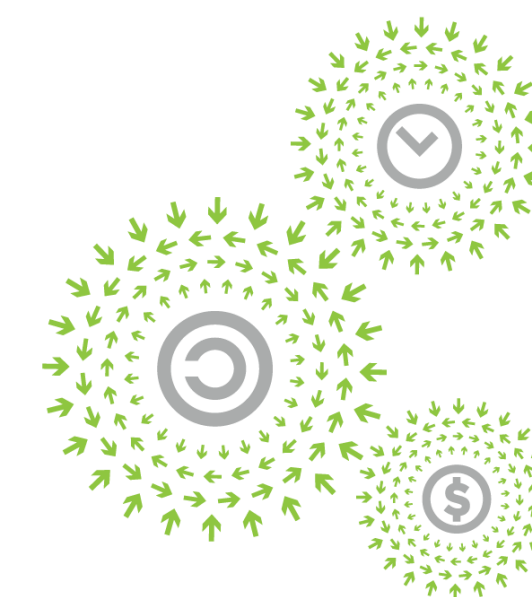
OCP Telco &
OpenEdge

OCP Data plane Acceleration for Edge Cloud

Ash Bhalgat, Sr. Director, Cloud Marketing, Mellanox Technologies

Mark Iskra, TME, Nuage Networks

Mike Moore, AirFrame openEDGE Marketing Director, Nokia



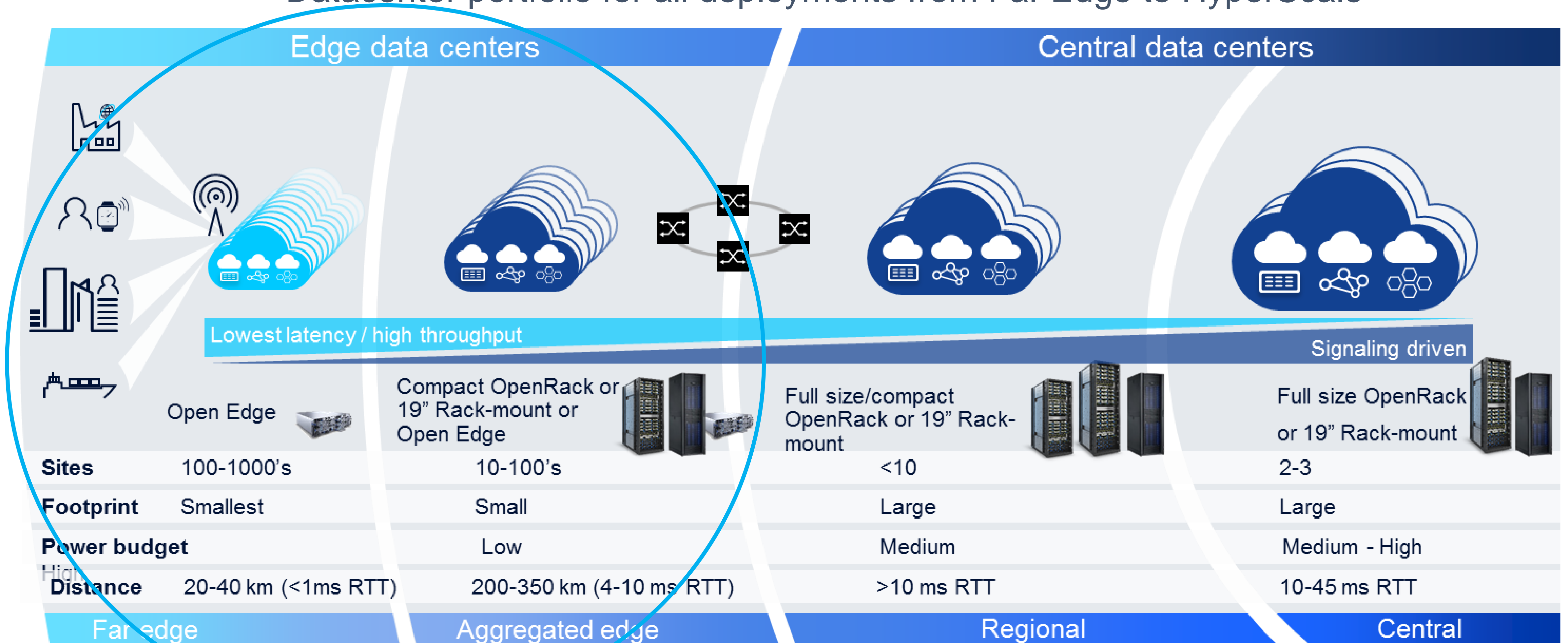
OPEN
PLATINUM™



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Managing the lowest latency/cost trade off with a layered architecture

Datacenter portfolio for all deployments from Far Edge to HyperScale



AirFrame open edge server: 5G performance in compact size

First x86 solution designed to fully support edge / far-edge cloud deployments

Ultra-small footprint



ARCHITECTURE

- 19" compatible: fits in any 600mm cabinet
- Compact form factor: 3RU high chassis
- Sleds either 1RU or 2RU high
- Fully front-operated (cabling, open rack-like tool less serviceability)
- Support for high end accelerators
- High availability: No SPOFs, redundant fans, hot swap storage
- Redundant fans; air flow configurable front to rear/rear to front

Environmental

- Full NEBS compliancy, seismic zone 4 [GR-63-Core, GR-1089-Core]
- Extended operating temperature range: -5C..+45C [ETSI EN300 019-1-3 Class 3.2]

DIMENSIONS

- 130.6 (3RU) x 440 x 430 mm (H x W x D)
- Ca. 12.0 kg / 26.5 lbs. (Chassis with PSU's and RMC)

POWER

- 2N redundant AC & DC power supplies
- Power fed to sleds through backplane
- 400W per 1U sled

MANAGEMENT

- All sleds managed through single interface in RMC unit
- On board BMC (in server sleds)

COMMODITY

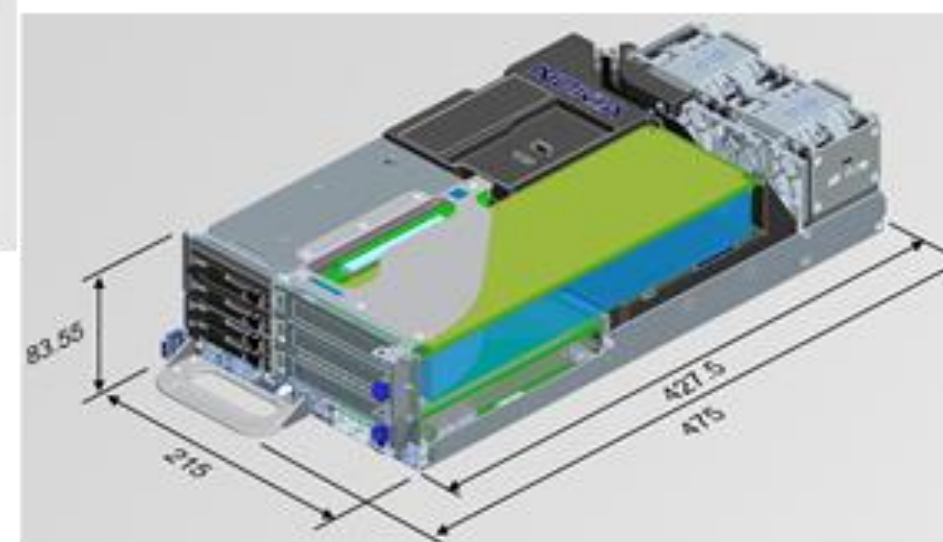
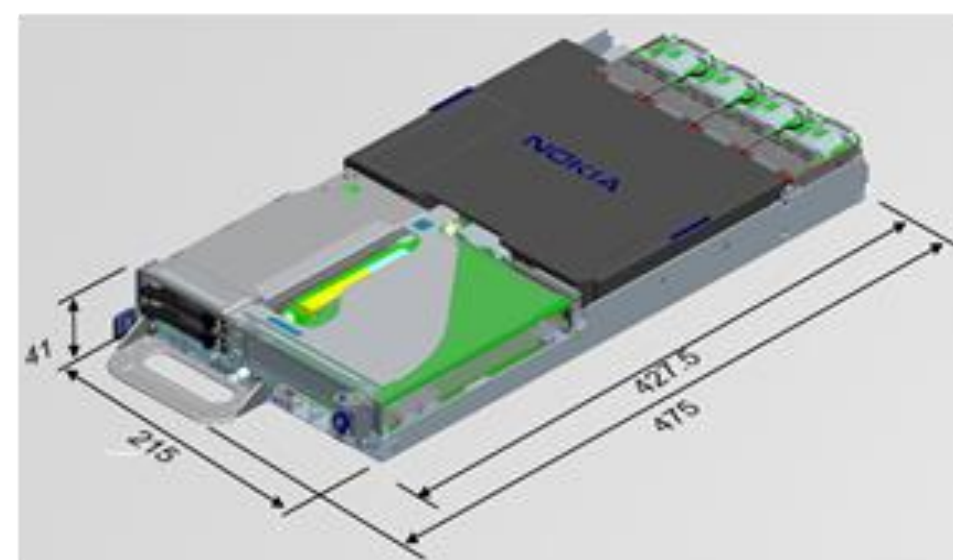
- support on server sleds
- Memories, disks and NICs from common AirFrame portfolio

AirFrame open edge server – 1U & 2U Sled

Intel Xeon® SP next gen



Ultra-small footprint



Processor (single socket)

- Intel® Xeon® SP, up to 24cores, 2,4GHz

Chipset

- Intel® C621/C627

Thermal

- Max. CPU TDP support: 205W/1U – 250W/2U
- Multiple Redundant dual rotor fans per node; air flow front to rear/rear to front

Memory

- DIMM slots: 6 typical (8 max)
- DIMM type: 16GB / 32GB / 64GB - DDR4 RDIMM 2933 MHz

Management

- RedFish, IPMI v2.0
- Compliant, on board BMC
- Access through RMC unit

Storage

- 2x 2,5" Hot-plug bays for SATA/NVMe devices 9,5/7mm
- 2x internal M.2 2280 or 22110 devices
- 2x 2,5" Hot-plug bays for SATA/NVMe drives 15mm (2U)

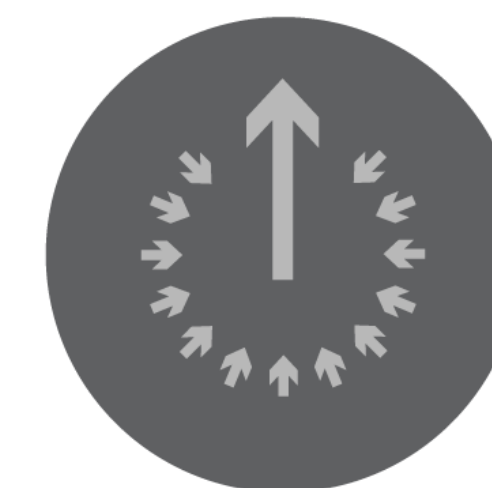
Security

- TPM 1.2/ 2.0

Dimensions, weight*

- 41(1U)/83(2U) x 215x 427mm (H x W x D)
- 3.4 kg / 7.5 lbs.** (1U) 4.7 kg / 10.4 lbs.** (2U)

*) Preliminary information; **) Server node with typical commodity



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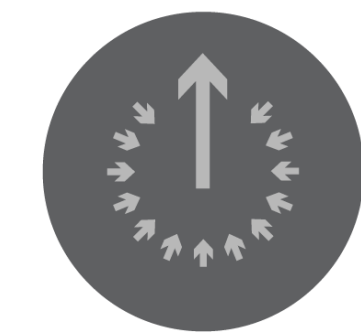


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Installation Examples



ConnectX-5: Best 10/25/40/50/100G Adapter



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- **World Class Connectivity and Performance**

- OCP 2.0 & 3.0 Compliant
- 10, 25, 40, 50, and 100G Ethernet
- World's First PCIe Gen4 Adapter
- 16 lanes of PCIe Gen3 / Gen4, PCIe switch

- **Telco/Edge Cloud Features**

- Advanced OVS Offload (ASAP²) and fastest DPDK
- Programmable packet switching in hardware
- Hairpin switching, Header rewrite
- Flexible SRIOV
- VXLAN/NVGRE/Geneve overlay with encap/decap
- RoCE over VXLAN

- **Fastest Data Path for Cloud Native and NFV**

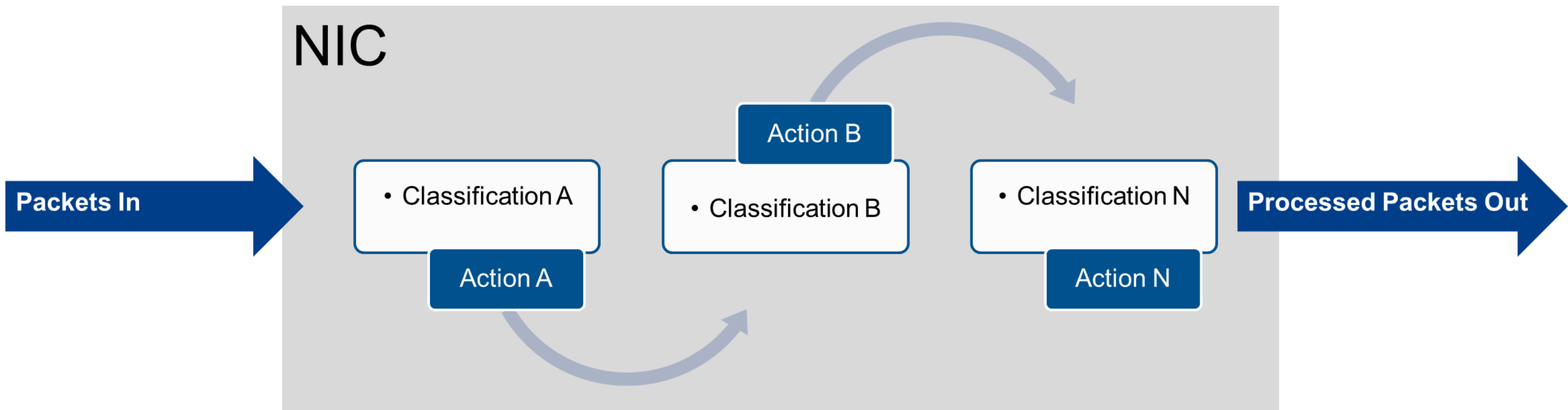
- **Machine Learning, AI, and Big Data offloads**
- **Storage offloads, including RDMA and NVMe-oF**



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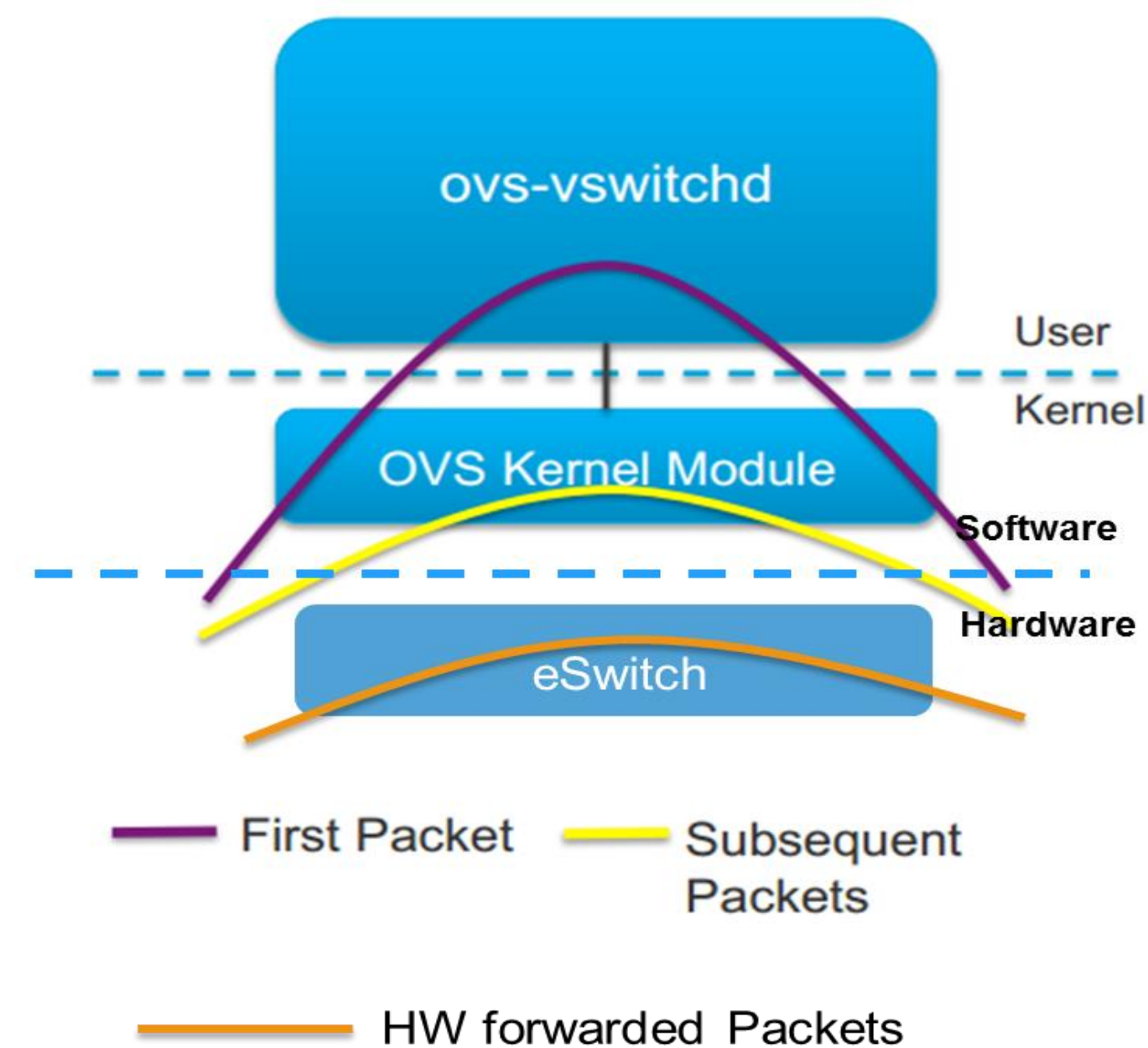
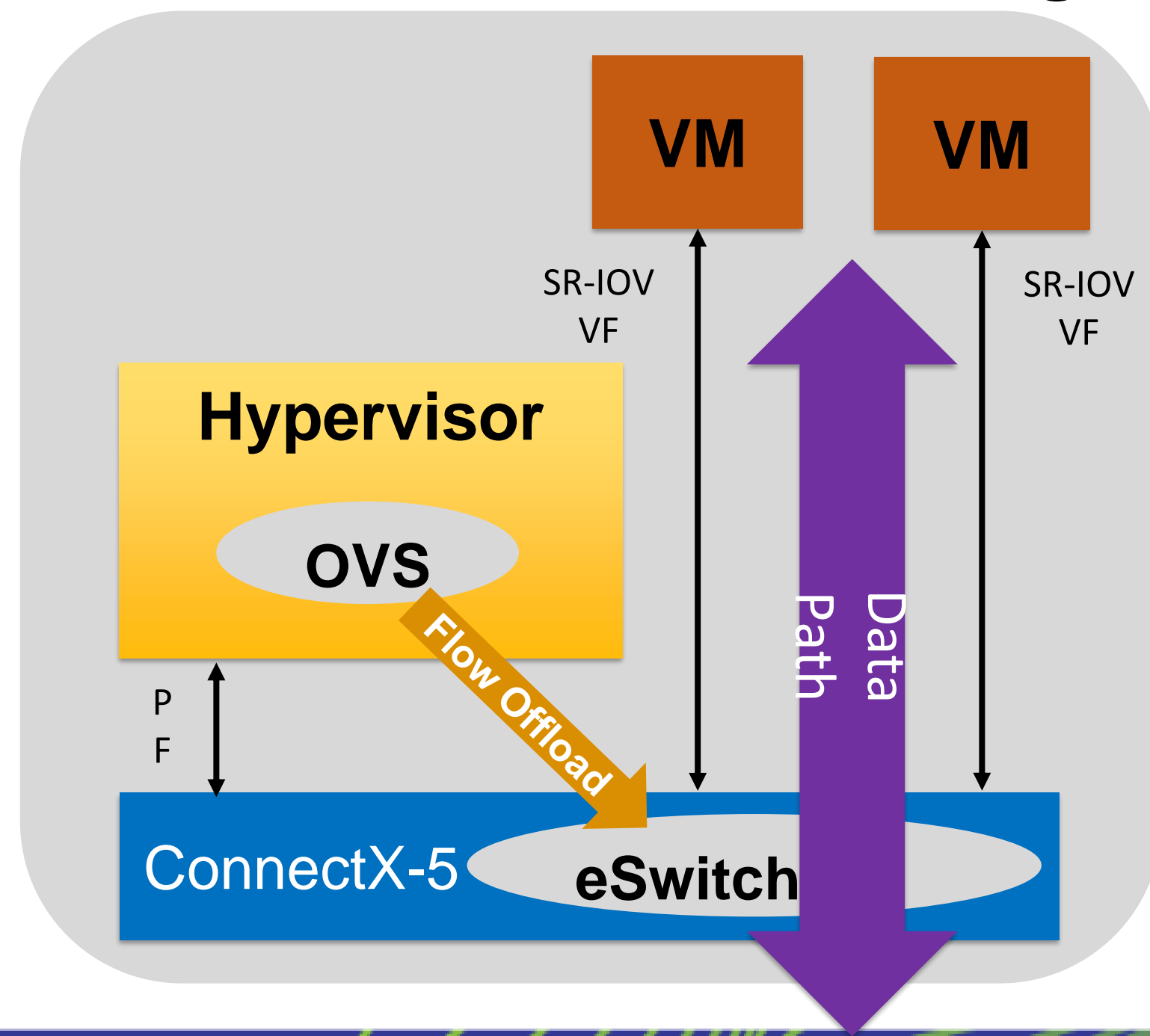
Common Operations in Networking

- Most network functions share some data-path operations
 - Packet classification (into flows)
 - Action based on the classification result
- **Mellanox NIC can offload both the classification and actions in hardware**



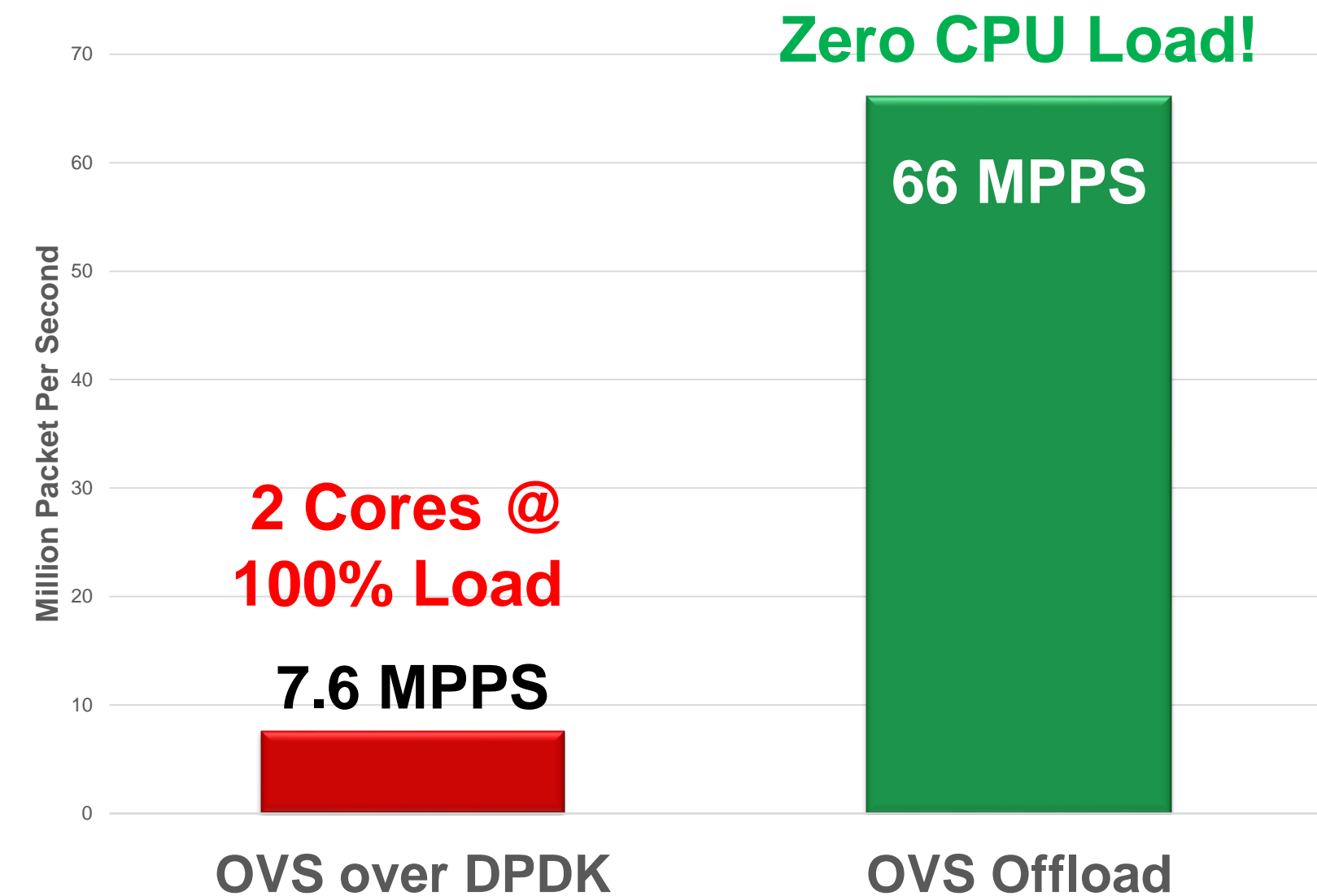
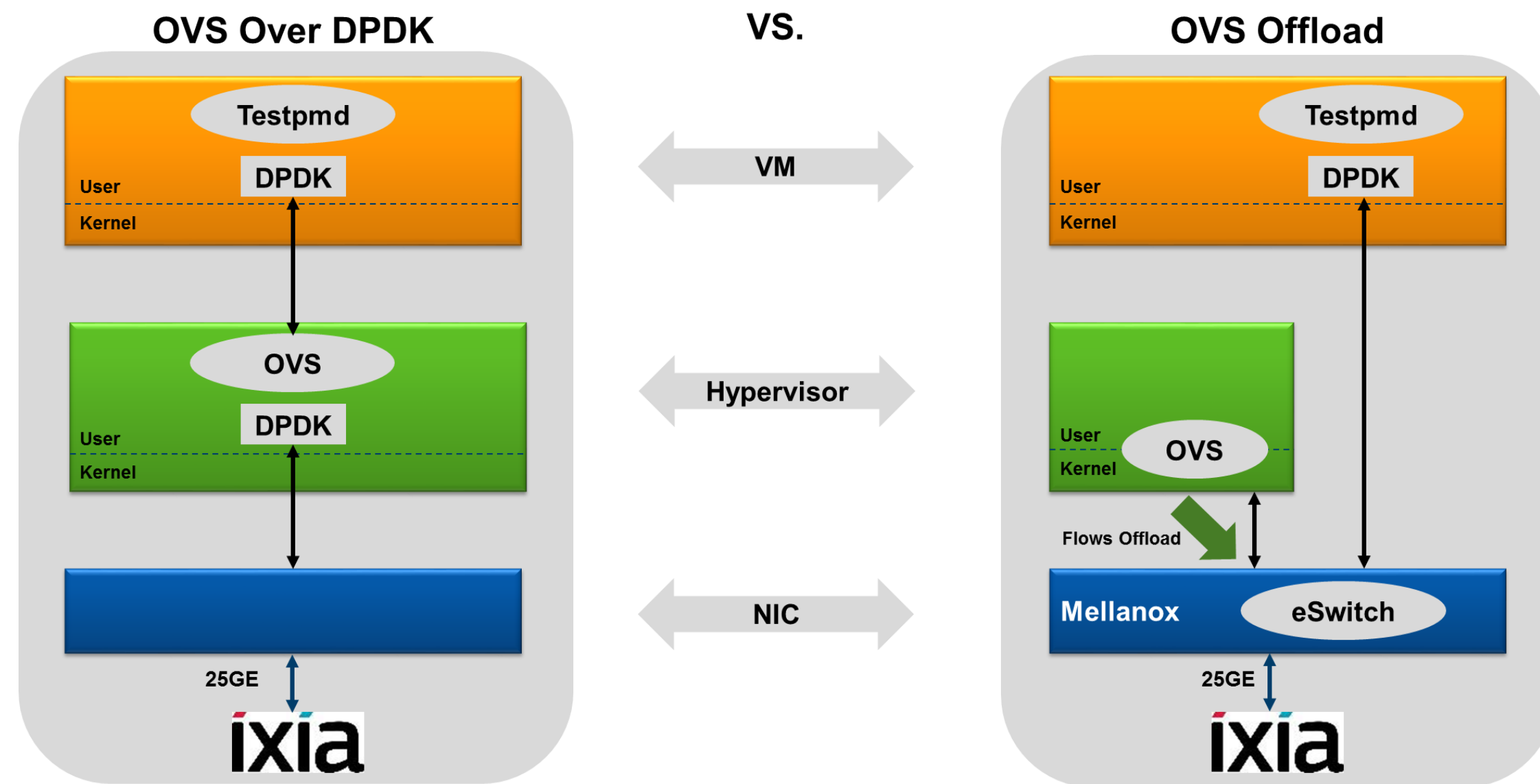
Full OVS Hardware Offload – Best of Both Worlds!

- **Mellanox OVS Offload: Accelerated Switching and Packet Processing (ASAP²)**
 - Open vSwitch as Standard SDN Control Plane
 - OVS data-plane offload to NIC-embedded Switch (eSwitch) – SR-IOV Data Path
- **Best of Both Worlds: SDN Programmability with Blazing Fast Switching Performance**



OVS over DPDK vs. OVS Offload – ConnectX-5

Highest Packet Rate with Zero CPU Utilization



Highest VXLAN throughput & packet rate
100% CapEx Savings with Zero CPU Utilization

Mellanox OVS Offload (ASAP²) Benefits

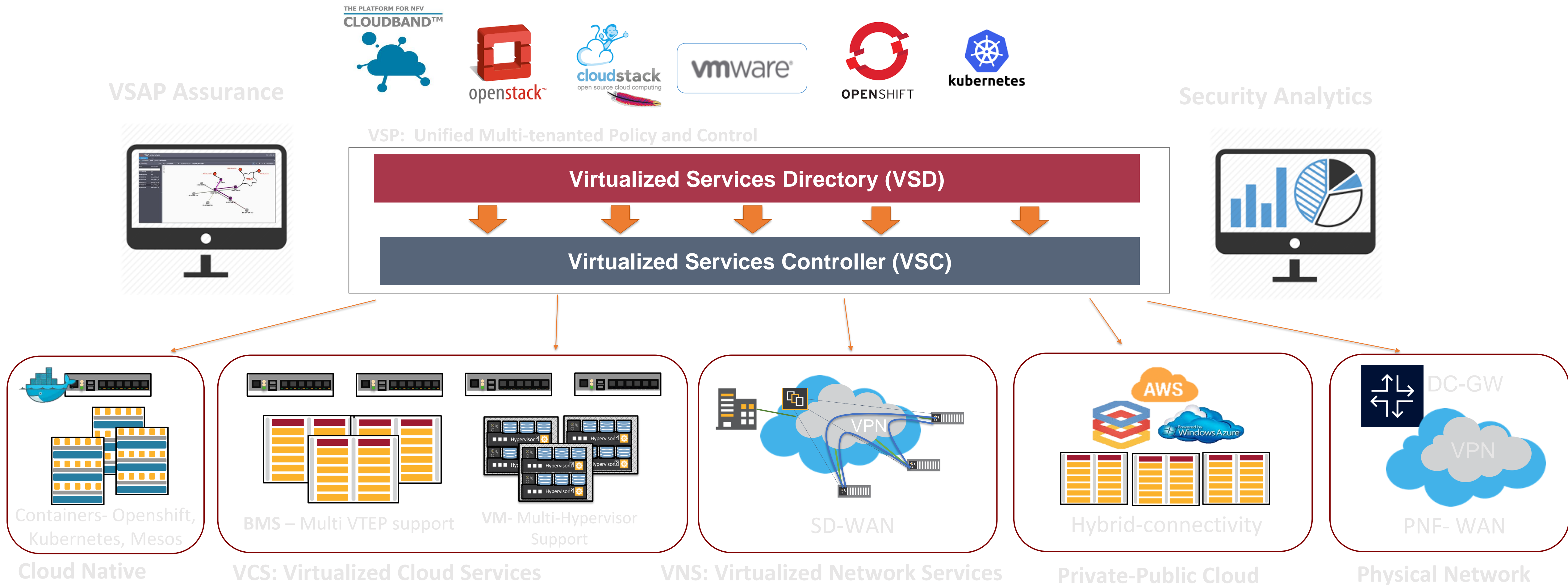
- 20X higher performance than vanilla OVS
- 8-10X better performance than OVS over DPDK
- Line rate performance at 25/40/50/100Gbps

Open Source Enabled – No Vendor Lock-in

- Adopted broadly by Linux community & industry
- Full Community Support (OVS, Linux, OpenStack)
- Ecosystem Support (Nuage/Nokia, Red Hat, ODL, etc.)

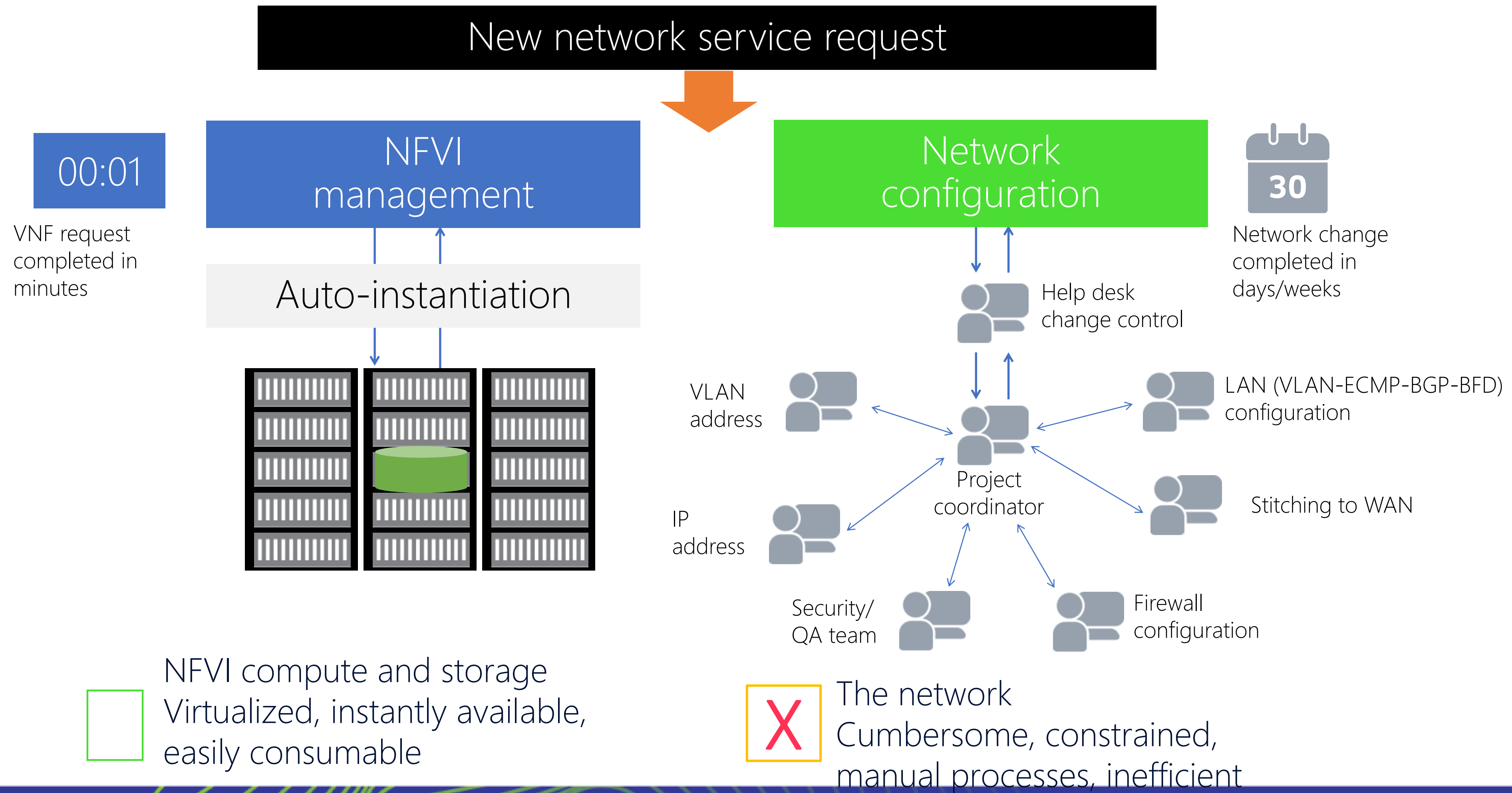
Nuage Networks Virtualized Services Platform (VSP)

SDN automating the Telco Cloud deployments leveraging VXLAN virtual networks



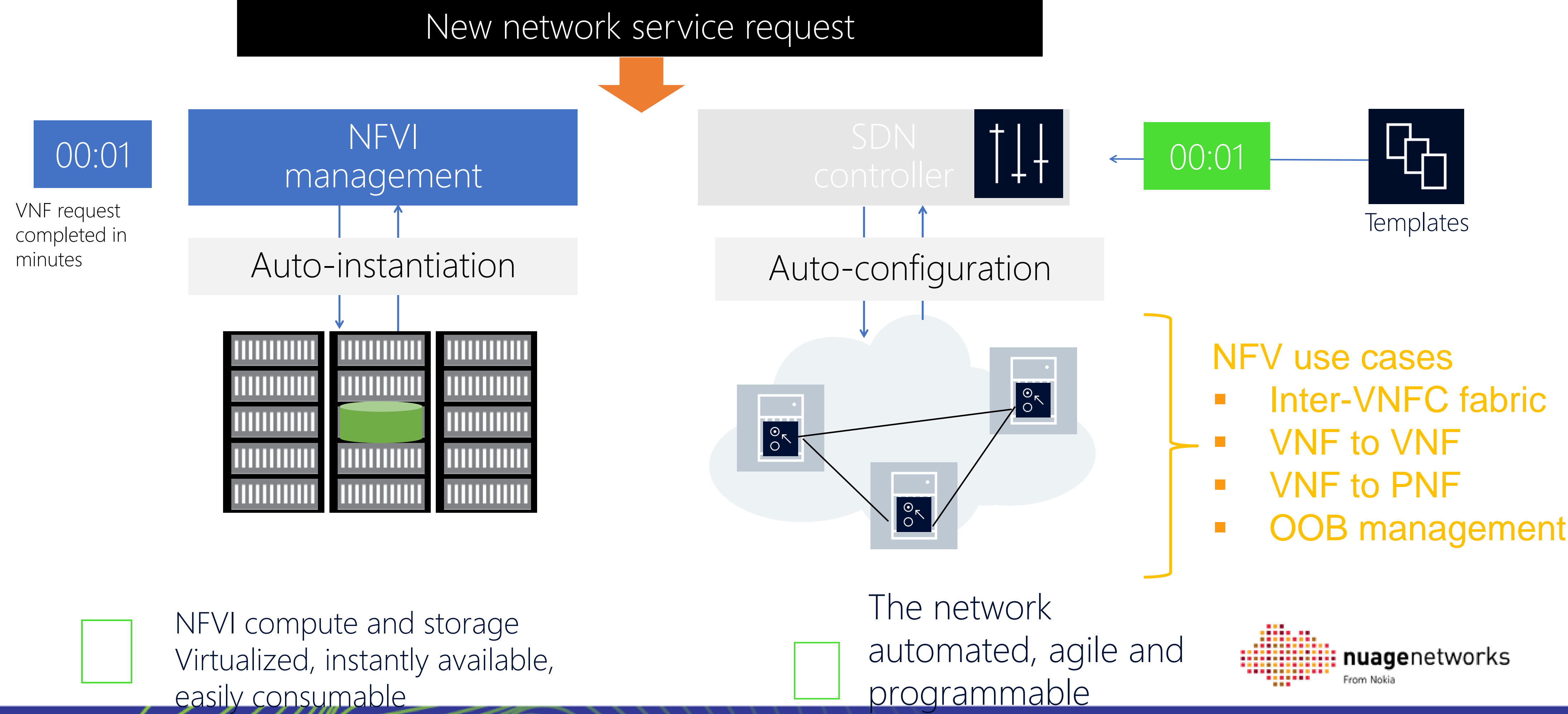
The Need for Telco Cloud NFV Automation

VNFs Have Multiple Networking And Security Requirements



SDN accelerates the pace of networking

Automating Deployment Requirements



Accelerated Dataplane VXLAN Performance

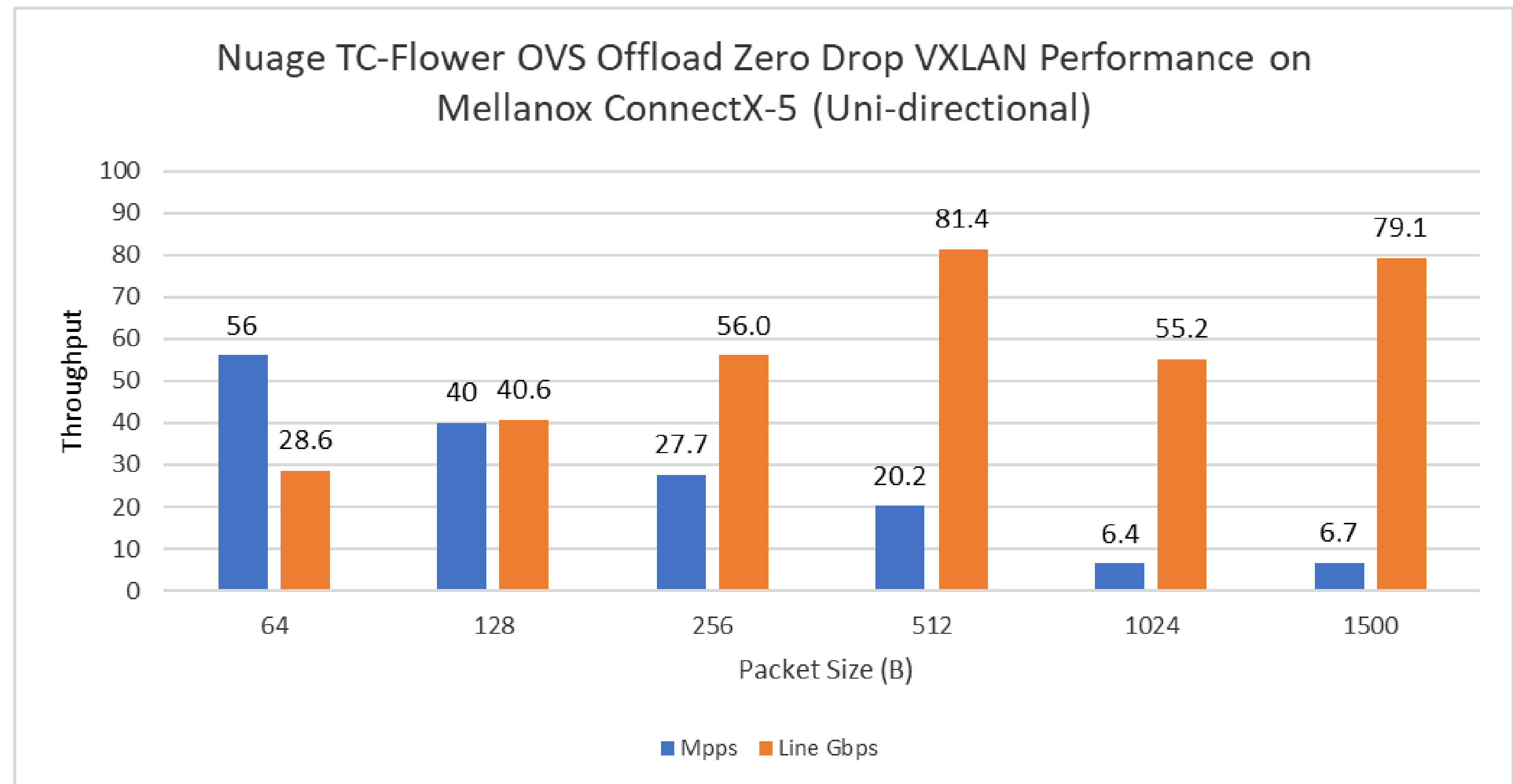
OVS Flows are programmed via tc-flower interface by Nuage Networks VSP (SDN)

Results:

- Zero CPU usage for VXLAN tunnels
- Zero packet loss in forwarding app
- T-Rex and TestPMD run in VMs
- 2 active tunneling flows

System Specs:

- Mellanox ConnectX-5 NIC (100Gbps)
- RHEL 7.5 Host and Guest
- Mellanox SN2100 Fabric Switch



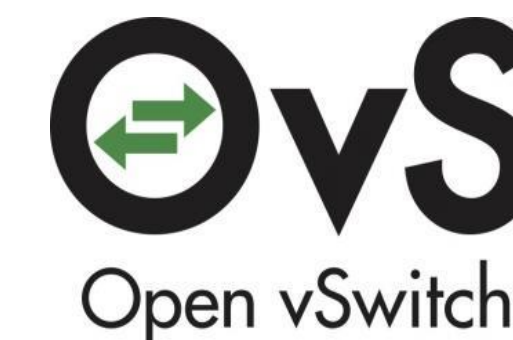
OVS Offload Availability Status

Open Source Components:

- ✓ **Kernel** code is upstream: **Kernel 4.8+**
- ✓ **OVS** code is upstream: **OVS 2.8+**
- ✓ **OpenStack** Release: **Queens**

Commercial Products:

- ✓ **Mellanox: ConnectX-4 and ConnectX-5**
- ✓ **Red Hat: RHEL 7.5 and RHOSP 13 (Tech Preview)**
- ✓ **Nuage Networks: VSP 5.4.1**



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Call to Action

This Project is open to the public and we welcome all those who would like to be involved.

Where to buy: <https://www.opencompute.org/products>

Project Wiki with latest specification:
<https://www.opencompute.org/wiki/Telcos/openEDGE>

Mailing list: <https://ocp-all.groups.io/g/OCP-Open-Edge>

See the Live Demo In Nokia Booth!



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OCP Global Summit | March 14–15, 2019

