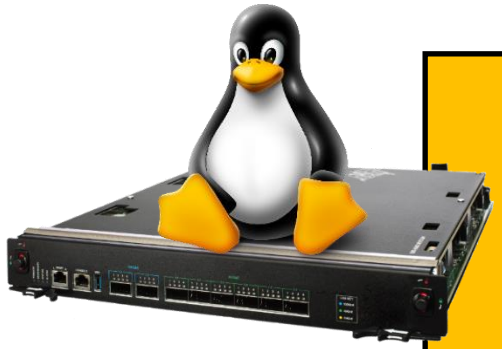
6WINDGate Architecture Overview

#SPEEDMATTERS For Serious Networks

6WINDGate Is The Secret Sauce For Networking

6WINDGate™



Dedicated Equipment	COTS Servers Bare Metal	COTS Servers Virtualization	Cloud Servers Containers - CUPS

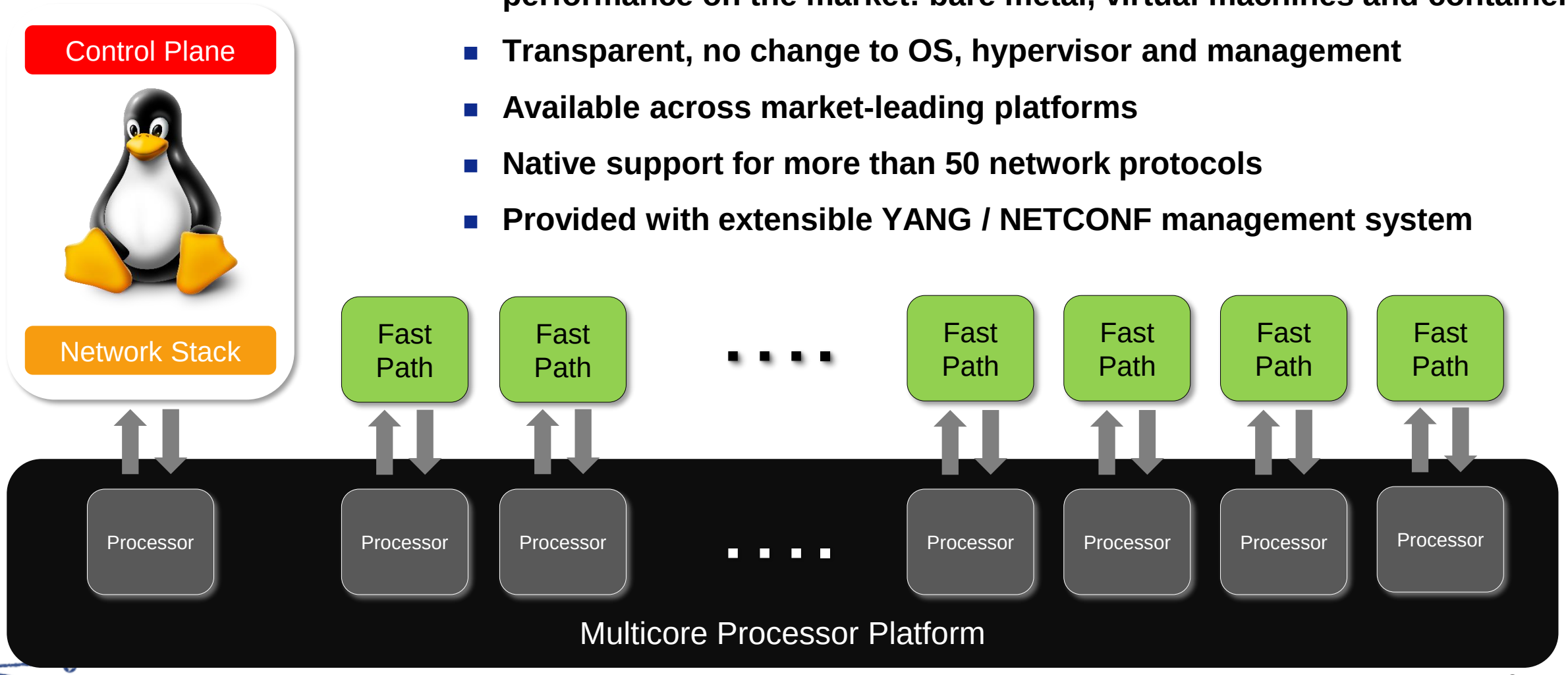
x86

DPDK
DATA PLANE DEVELOPMENT KIT

arm

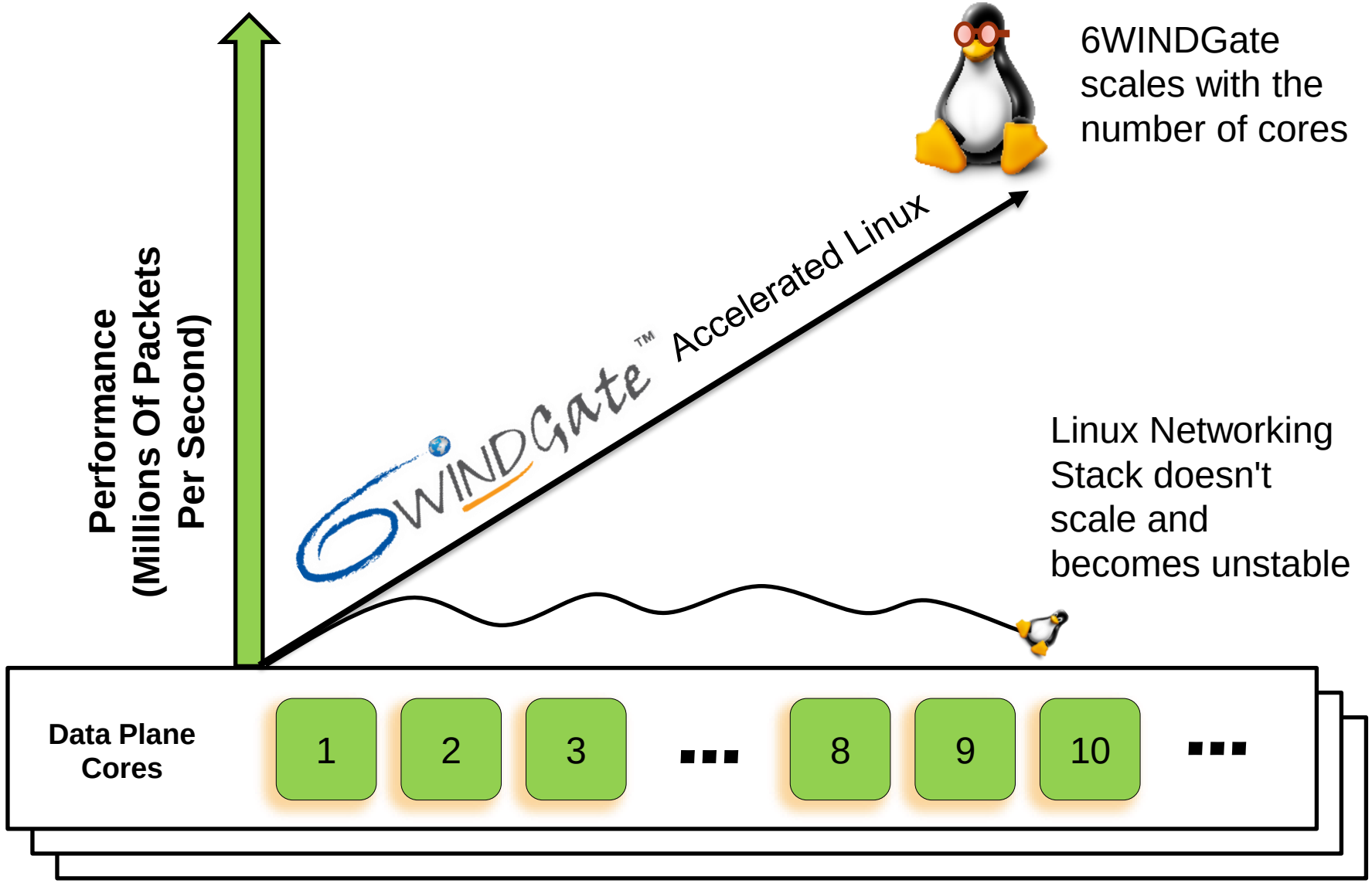
6WINDGate Packet Processing Software

- **Dedicated and optimized Data Plane software providing fastest performance on the market: bare metal, virtual machines and containers**
- **Transparent, no change to OS, hypervisor and management**
- **Available across market-leading platforms**
- **Native support for more than 50 network protocols**
- **Provided with extensible YANG / NETCONF management system**



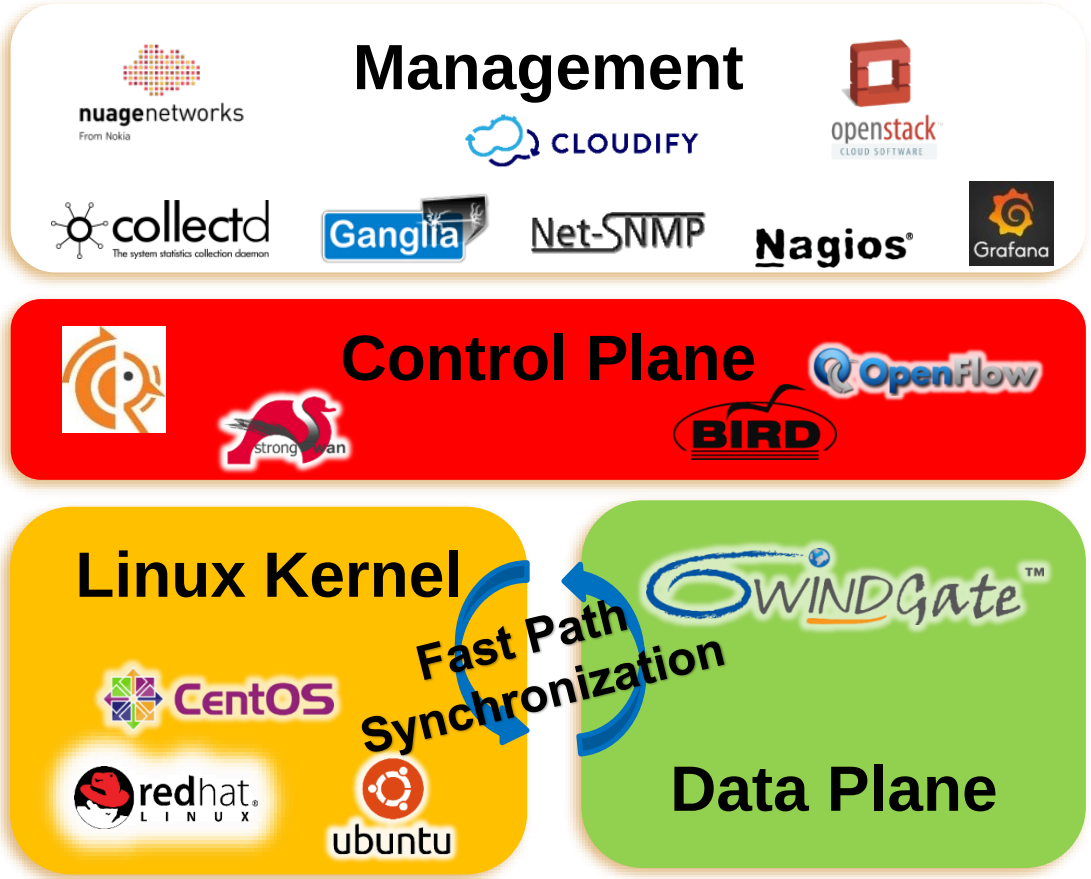
6WINDGate Data Plane Scales Linux Networking Performance

- **Dedicated Data Plane isolated from Linux ensures deterministic performance**
- **Lockless, optimized stack design enables linear scalability on multicore platforms**



Seamless Integration with Linux

- Existing Linux applications are not modified and developing new applications is pure Linux development
- Compatible with third-party open source or commercial Control Plane applications that configure Linux (routing, IKE, ...)
- Linux management tools can be re-used (iproute, iptables, ipset, brctl, ovs-*ctl, tcpdump, etc.)
- Leverage eBPF to make Fast Path transparent to applications



Linux Running 6WINDGate is Linux

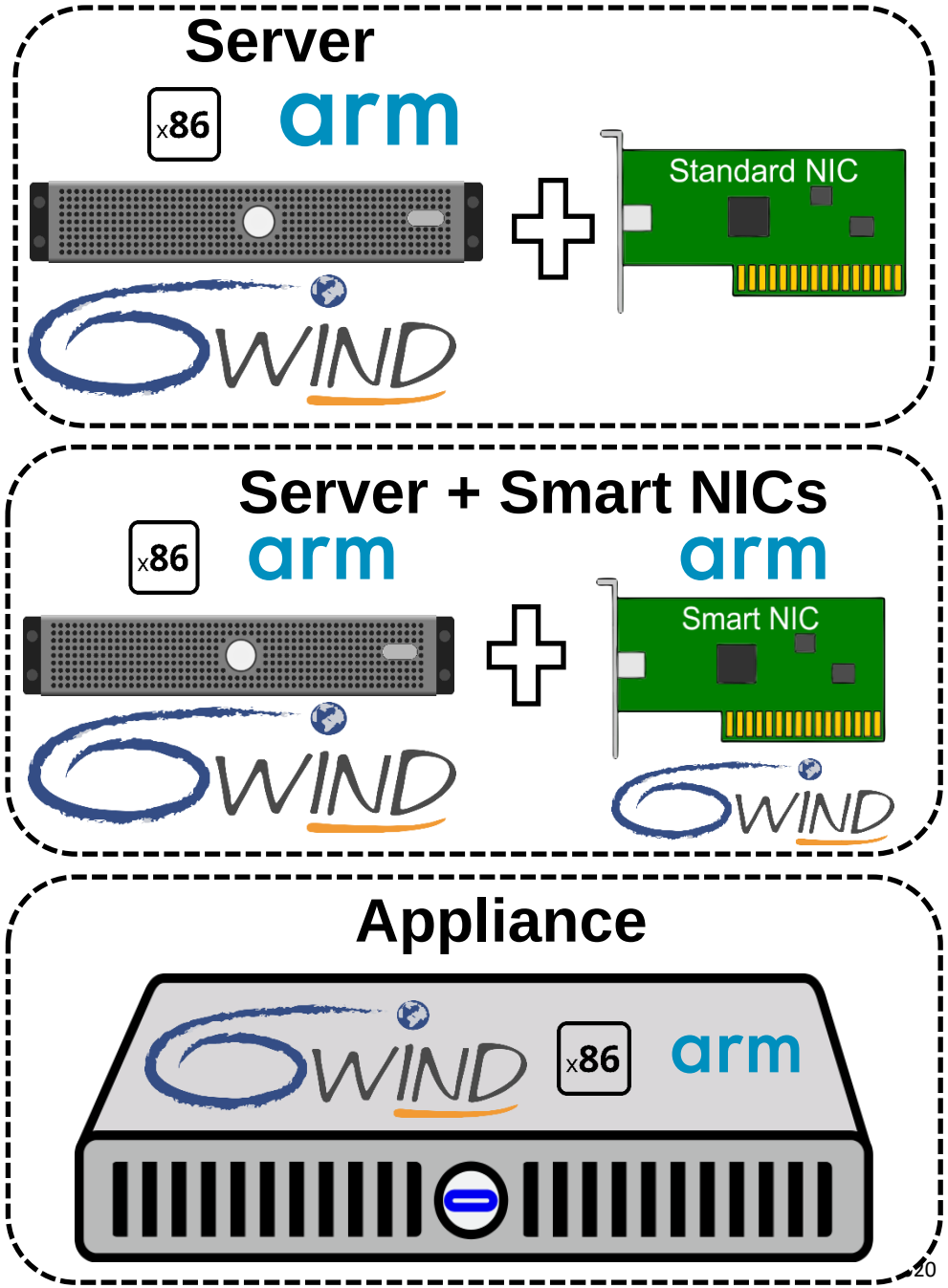
6WIND Supported Processors & Architecture

- Choose the best architecture for your requirements
- Migrate seamlessly across architectures
- Scale same software across architectures

x86

arm

DPDK
DATA PLANE DEVELOPMENT KIT



Accelerated Layer 2-4 Stacks Synchronized with Linux

OVS | Security | Routing, | L2TP, PPPoE

Control Plane

Routing | Security | VRRP | CLI | sFlow | KPIs

Management

DMS | VRRP

HA ARP / NDP | HA FW / NAT | HA IPsec / IKE

High Availability

VRF

Linux / Fast Path Synchronization

Tools

6WINDGate Build Framework

6WINDGate Linux Distribution

Fast Path

GTPu	Segment Routing v6	L2TP Client / Server	PPPoE Client / Server				
NAT	Policy-based Routing	Flow Inspection	Multicast IPv4/v6	MPLS	OVS Acceleration	TCP/UDP Termination IPv4/ v6	TLS / DTLS Termination
Reassembly IPv4/v6	Tunneling (IPinIP)	IPsec IPv4/v6	IPsec SVTI	Filtering Ethernet Bridging	Filtering IPv4/v6	CG-NAT	CG-Firewall
Ethernet Bridge	VLAN	VXLAN	LAG	GRE	Forwarding IPv4/v6	QoS Basic	QoS Advanced

DPDK | x86 | arm

FPN - SDK

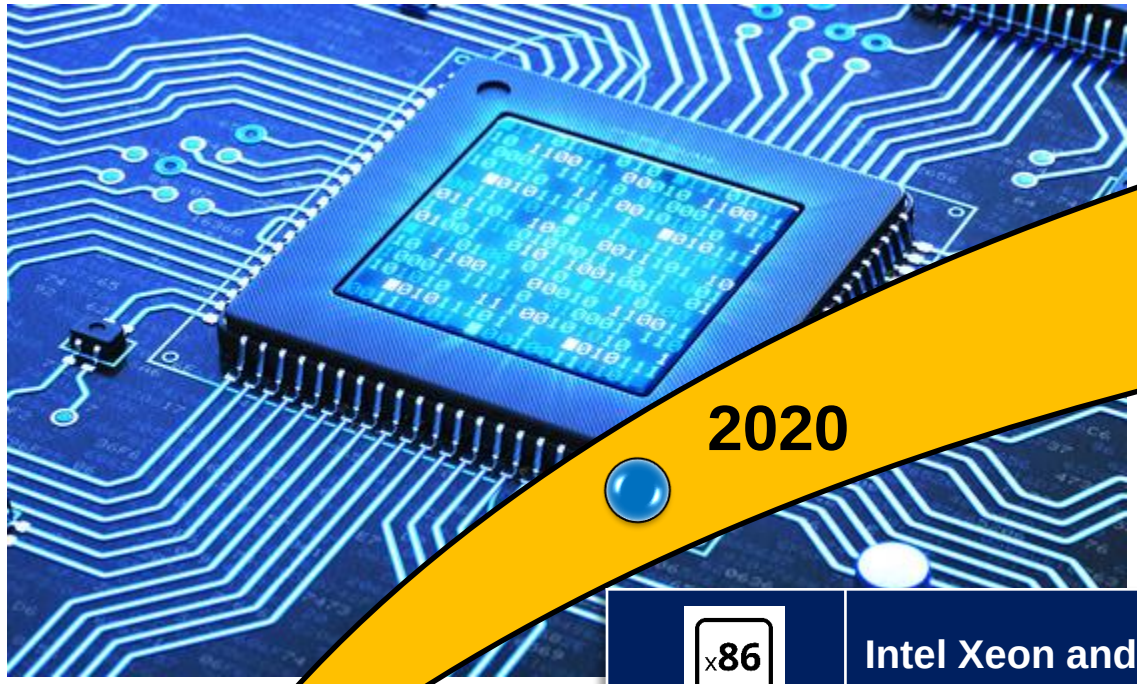
Intel® Multi-Buffer Crypto | Hardware Crypto Support (Intel® QAT and ARM crypto) | Virtio Host PMD

BROADCOM | Mellanox TECHNOLOGIES | intel

Supported NICs

6WINDGate DPDK

6WIND Processor Roadmap



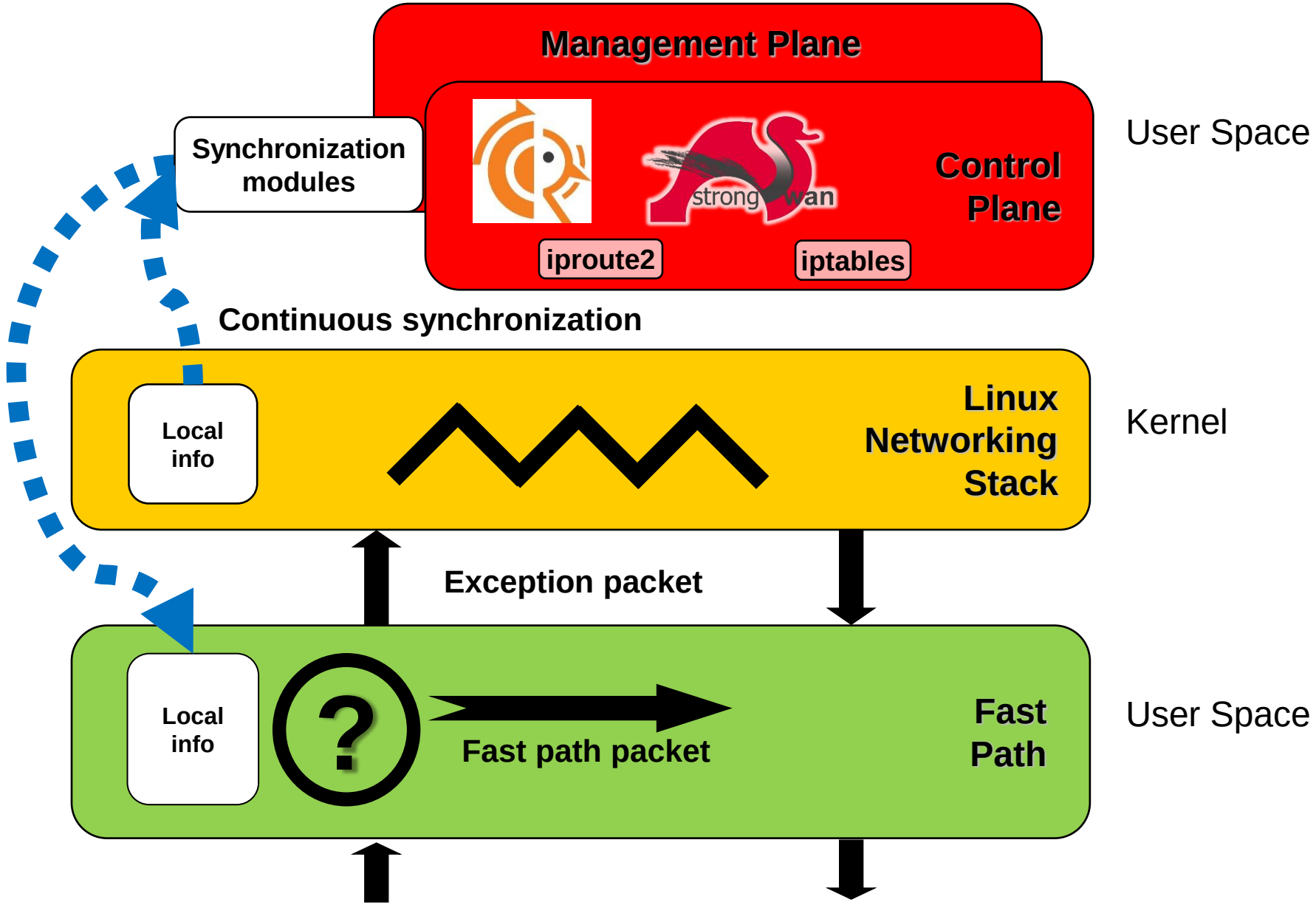
2020

x86	Intel Xeon and Atom
arm	NXP LS1046
	Marvell Octeon TX2
	Marvell Armada
KALRAY	*Coolidge*

2021

x86	Intel Xeon and Atom
	AMD EPYC II
arm	NXP LS1046
	NXP LS2046/2044A
	Marvell Octeon TX2
	Marvell Armada
KALRAY	Coolidge

6WINDGate Architecture

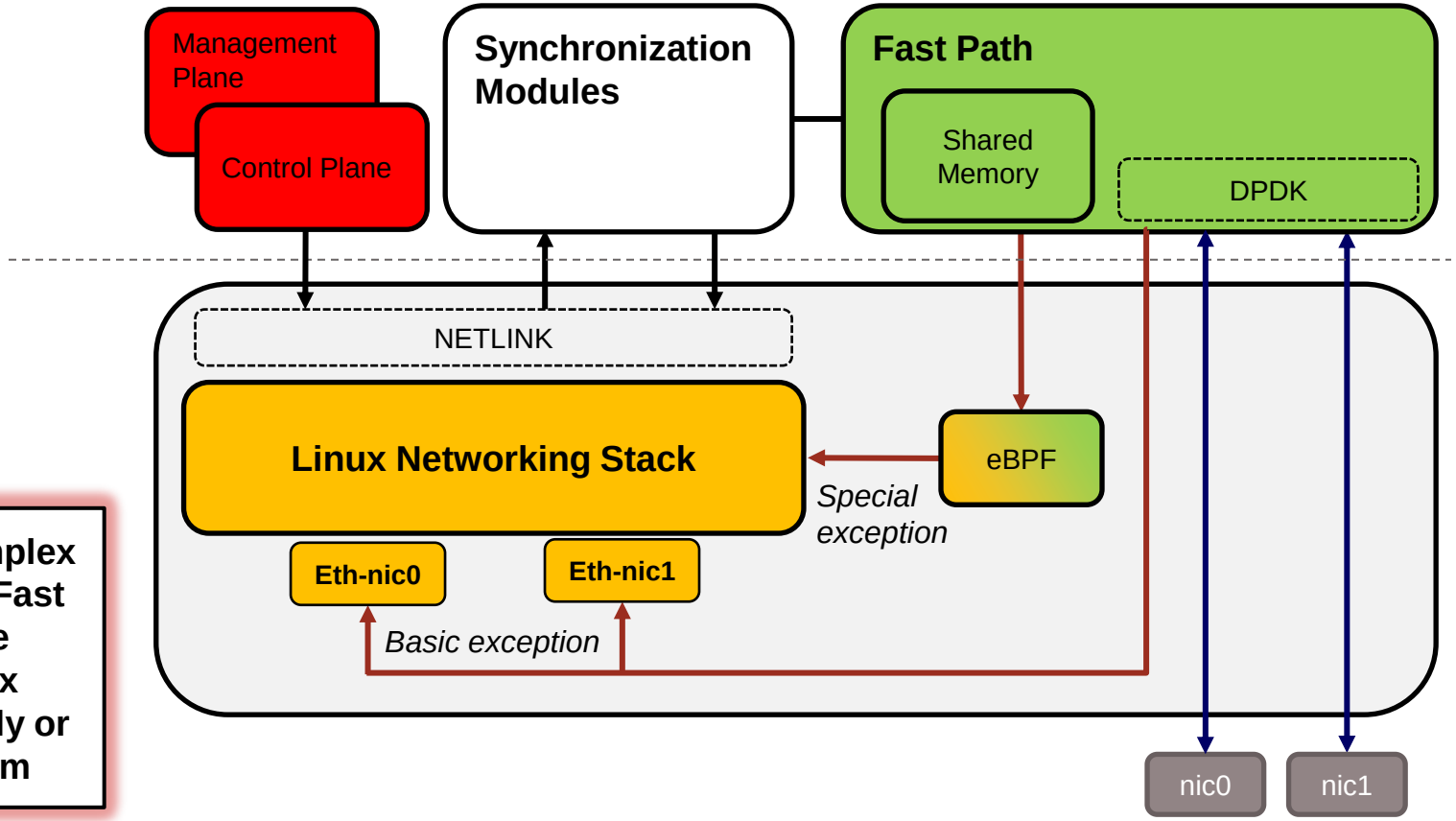


6WINDGate Main Components

As a result, unmodified Linux applications transparently use the accelerated Data Plane as a standard Linux stack

Linux Networking Stack and Fast Path states are synchronized in a shared memory using Netlink

Dedicated optimized userland Data Plane running on top of DPDK



Packets that are too complex to be processed by the Fast Path (exceptions) are reinjected in the Linux Networking Stack directly or using an eBPF program

6WINDGate Detailed Architecture

1 Fast Path

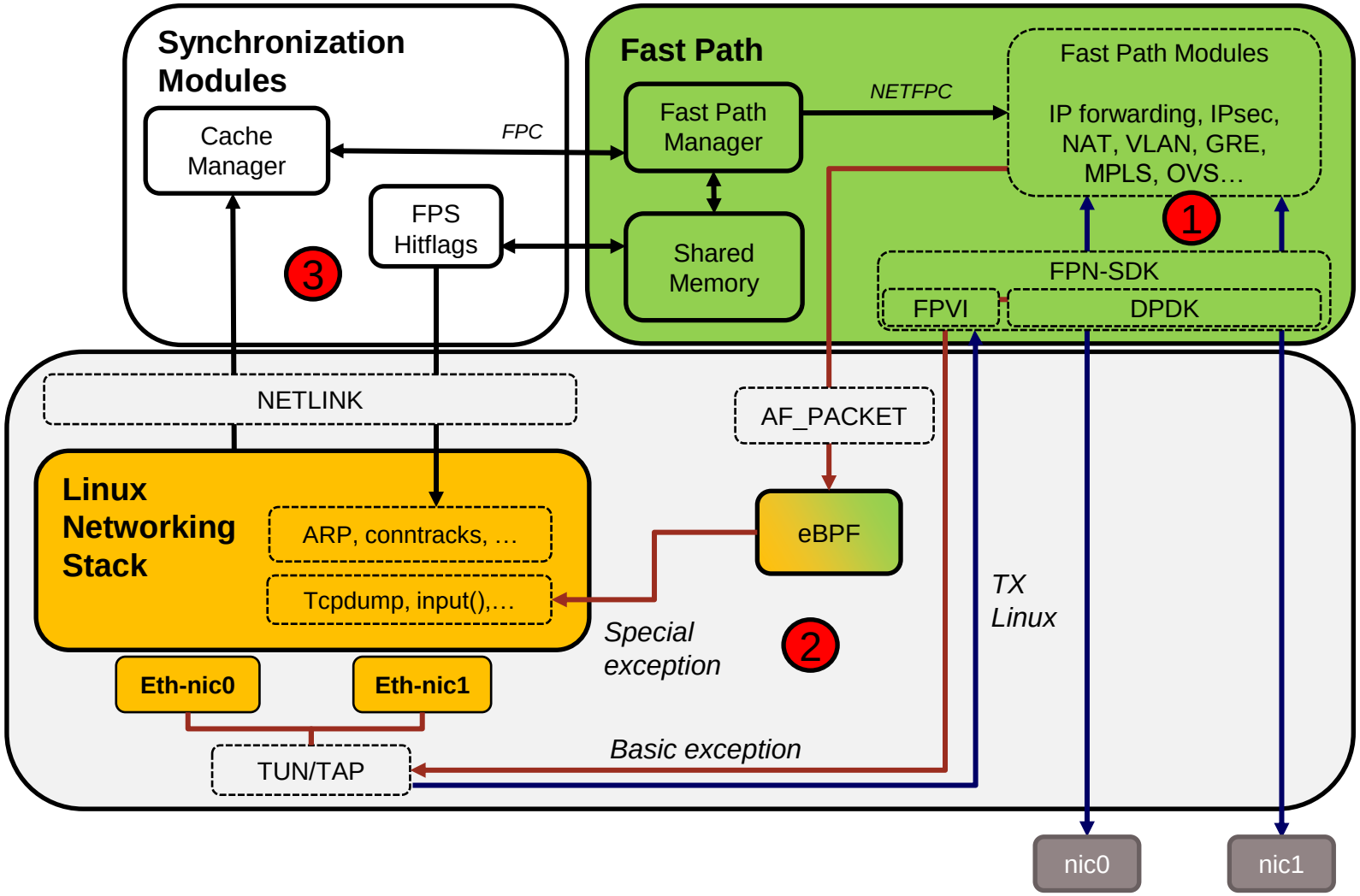
- Fast Path modules on top of DPDK
- Process Linux TX packets
- Read configuration from shared memory and store usage and statistics

2 Exception path

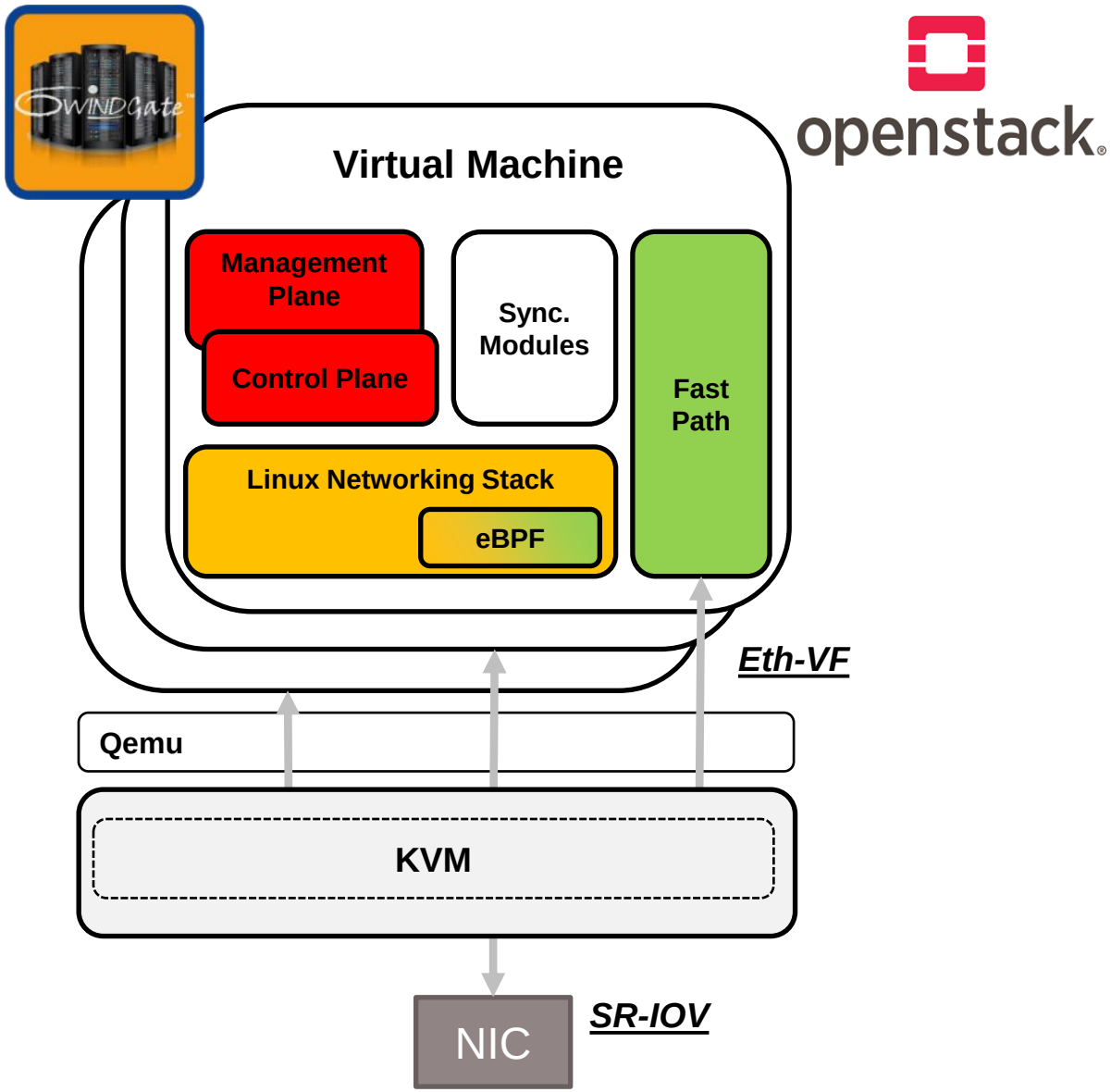
- Basic RX for packets unmodified by Fast Path
- Special RX with eBPF for injecting packets modified by Fast Path in Linux Networking Stack

3 Synchronization

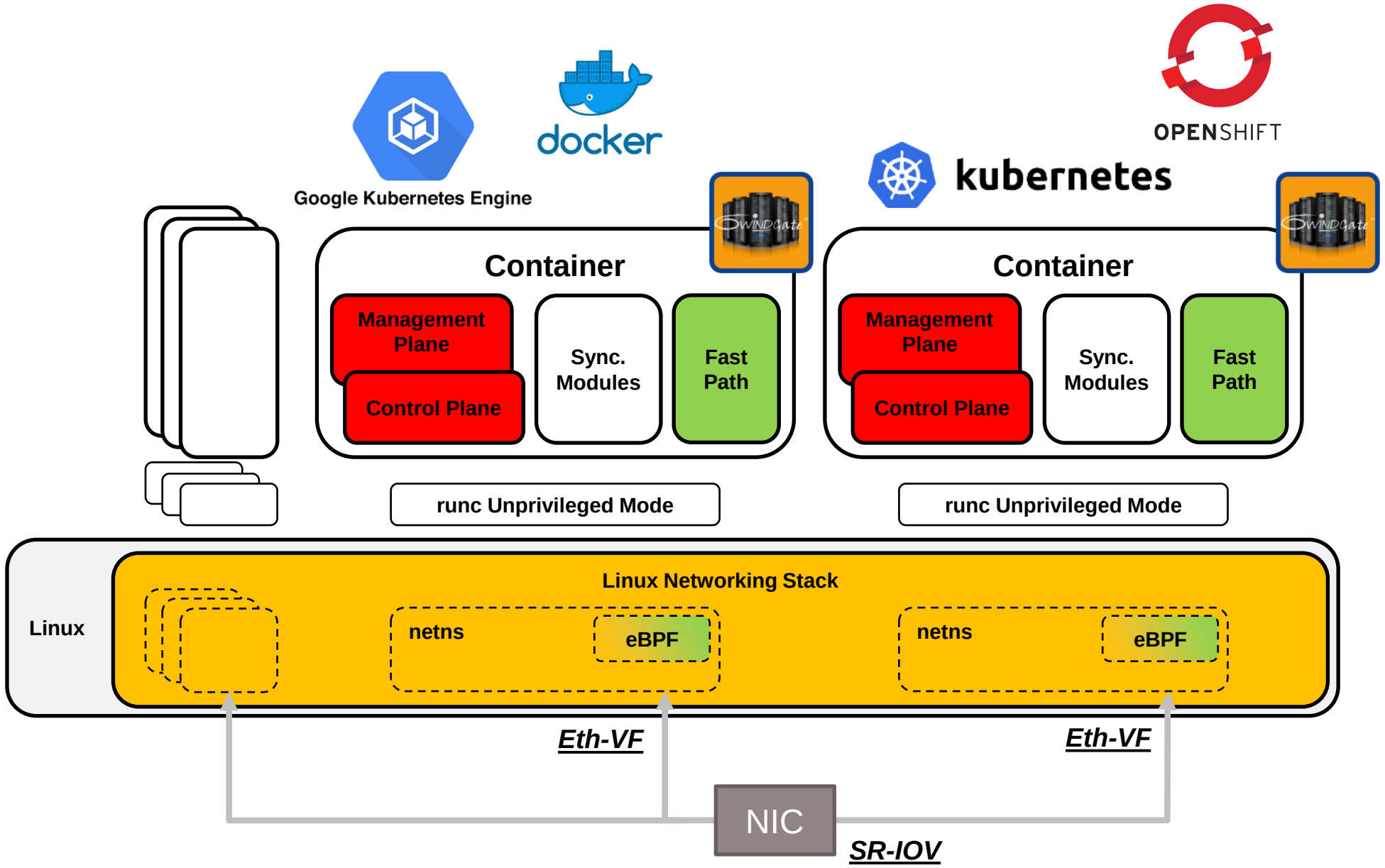
- Netlink monitoring to reflect kernel configuration into the shared memory
- FPS / Hitflags to update kernel states from shared memory



6WINDGate Deployment In Virtual Machines



6WINDGate Deployment In Containers



6WINDGate Standard-Based Management Architecture

- **Configuration**
  - NETCONF-based configuration
  - 6WINDGate CLI client
- **Engine and data store**
  - YAMS: Python-based engine configuring and monitoring all network components
  - YANG model data store
- **Monitoring / analytics**
  - SNMP / sFlow APIs
  - Telegraf KPI agent collecting all statistics ready for streaming