OpenMANO

The Dataplane Ready Open Source NFV MANO Stack

Diego R. Lopez
Telefonica I+D
March 2015

NFV Ain't Cloud Applied to Carriers

The network differs from the computing environment in 2 key factors…

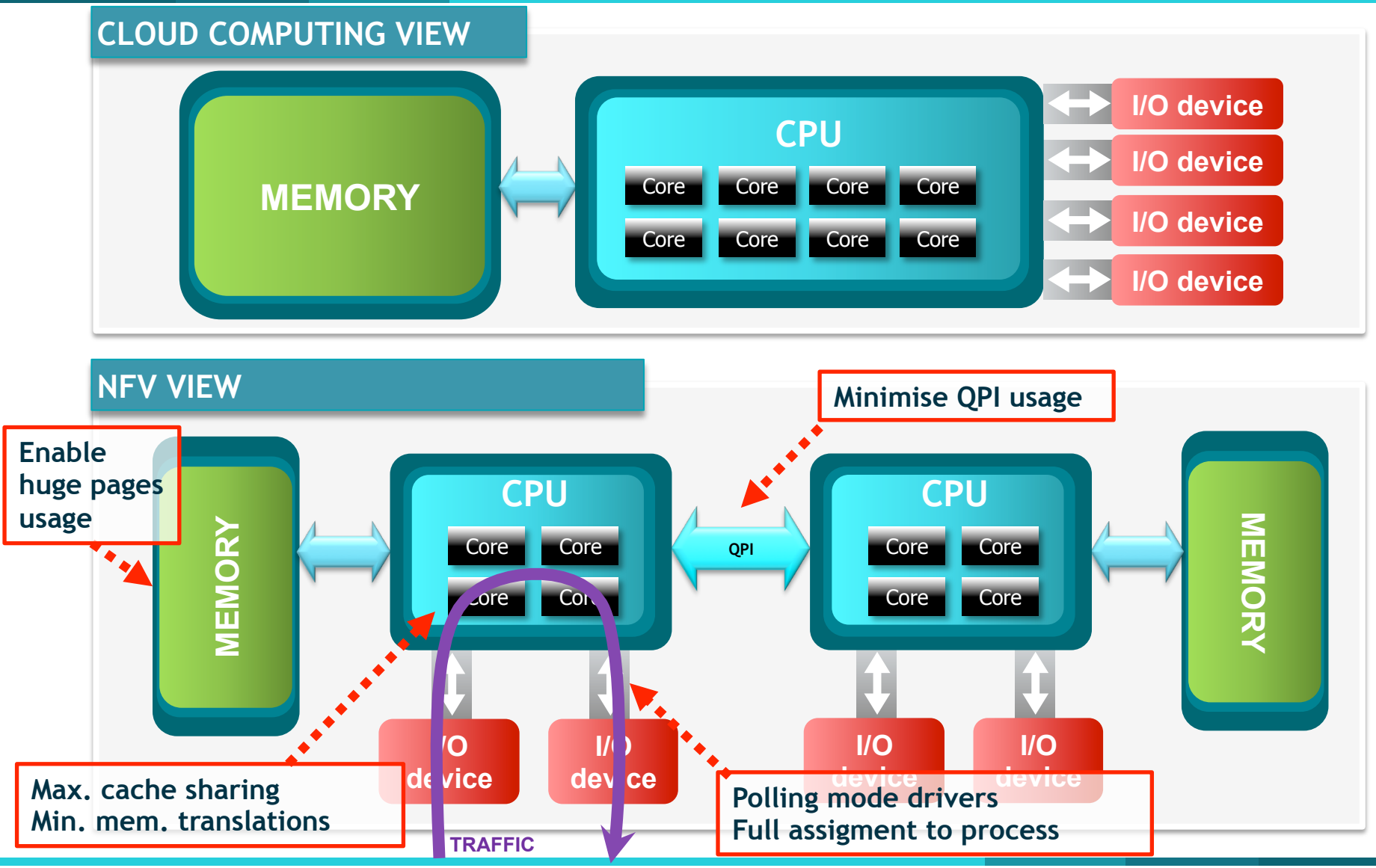
1. **Data plane workloads** (which are huge!) → HIGH PRESSURE ON **PERFORMANCE**

2. **Network requires shape** (+ E2E interconnection) → GLOBAL NETWORK VIEW IS REQUIRED FOR **MANAGEMENT**

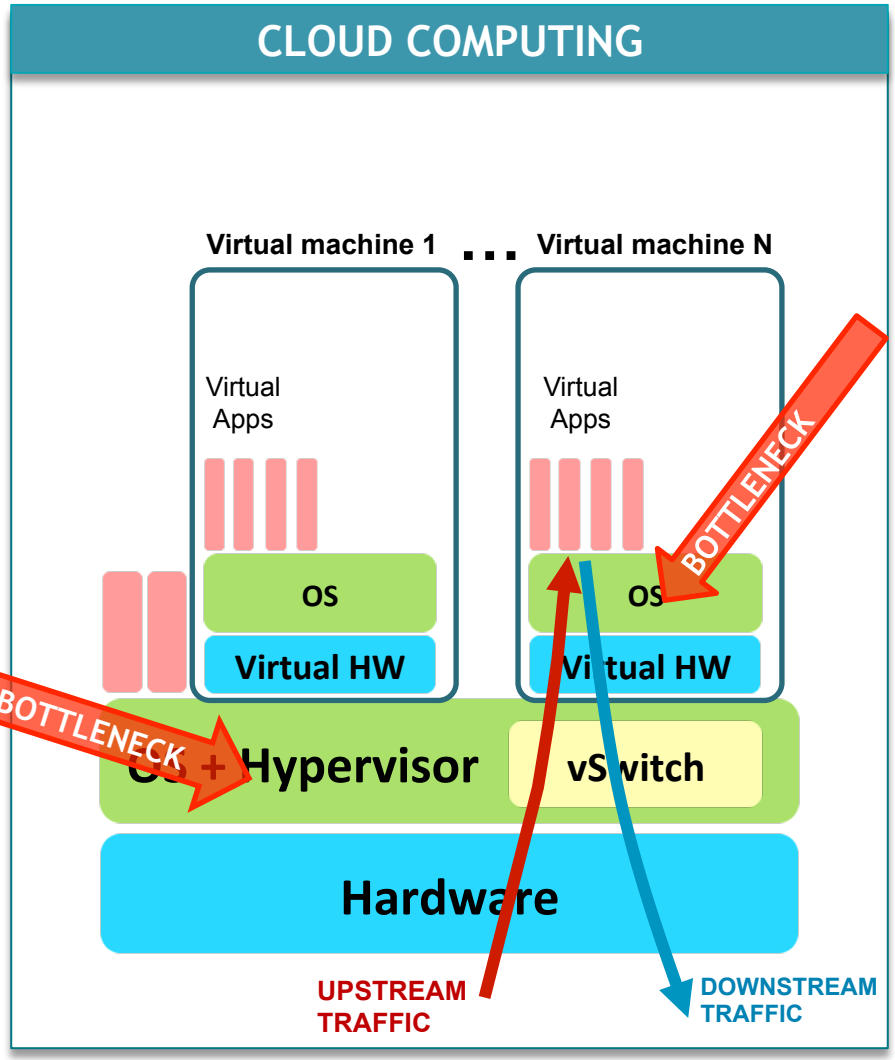
…which are big challenges for vanilla cloud computing.

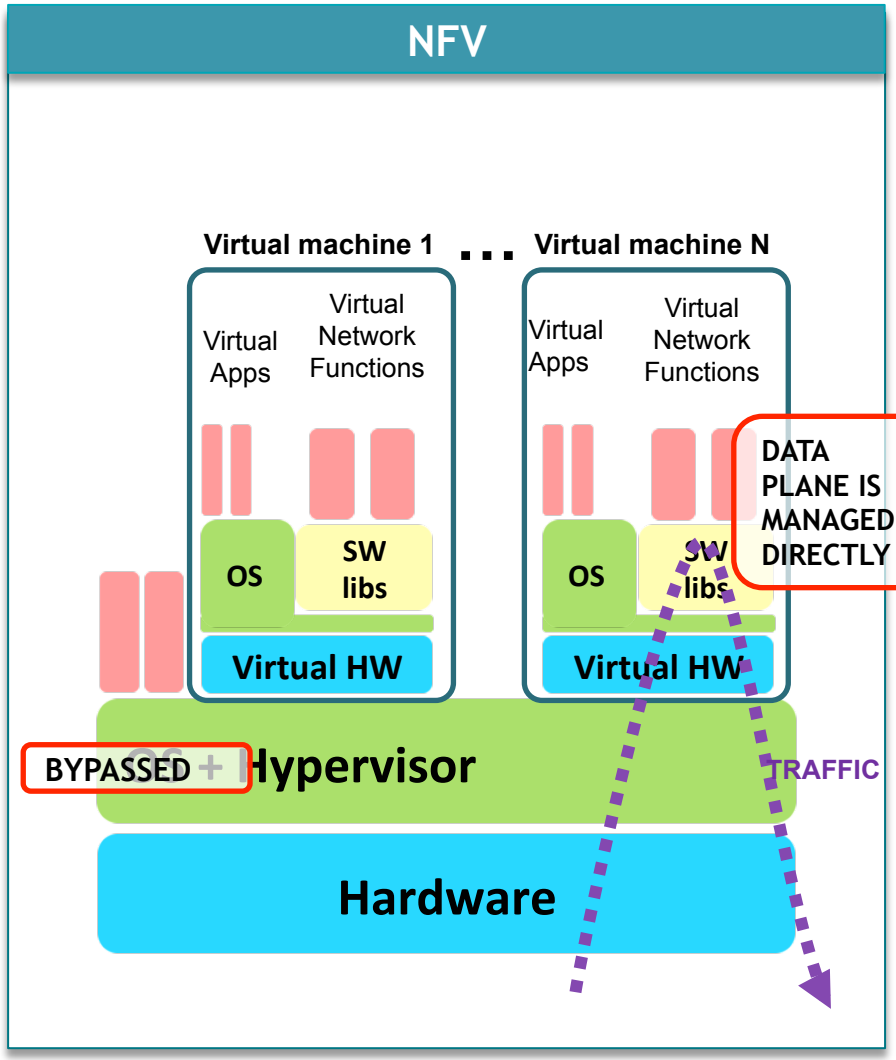
AN ADAPTED VIRTUALISATION ENVIRONMENT IS NEEDED
TO OBTAIN **CARRIER-CLASS** BEHAVIOUR

Applying Enhanced Platform Awareness (EPA)



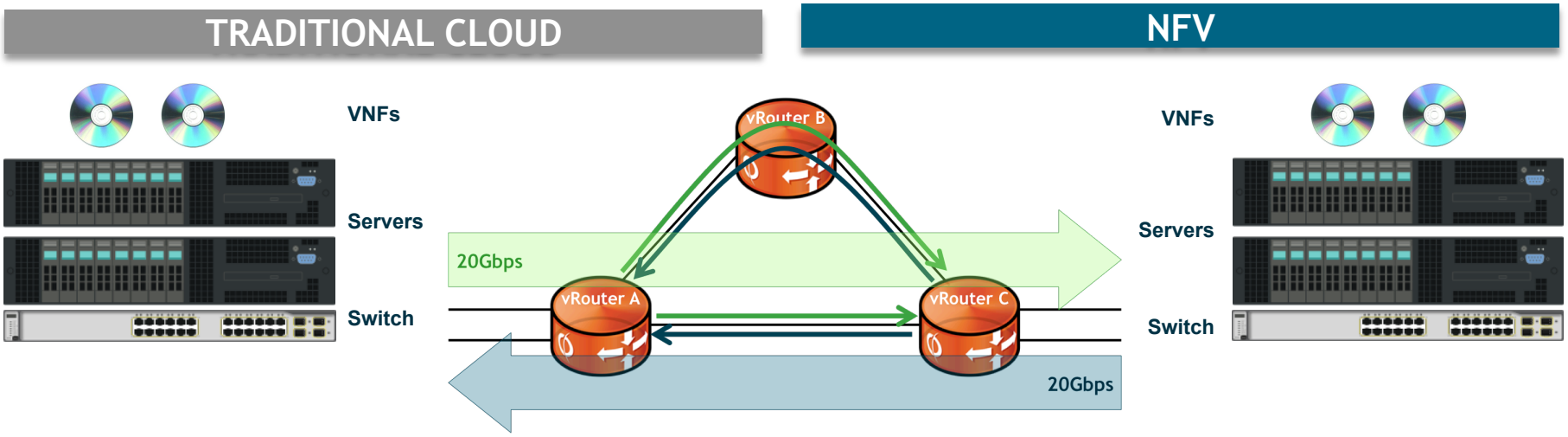
Avoiding Bottlenecks in the Hypervisor and OS





Recently Demonstrated (at MWC 2015)

Identical infrastructure and VNFs
Different MANO stacks



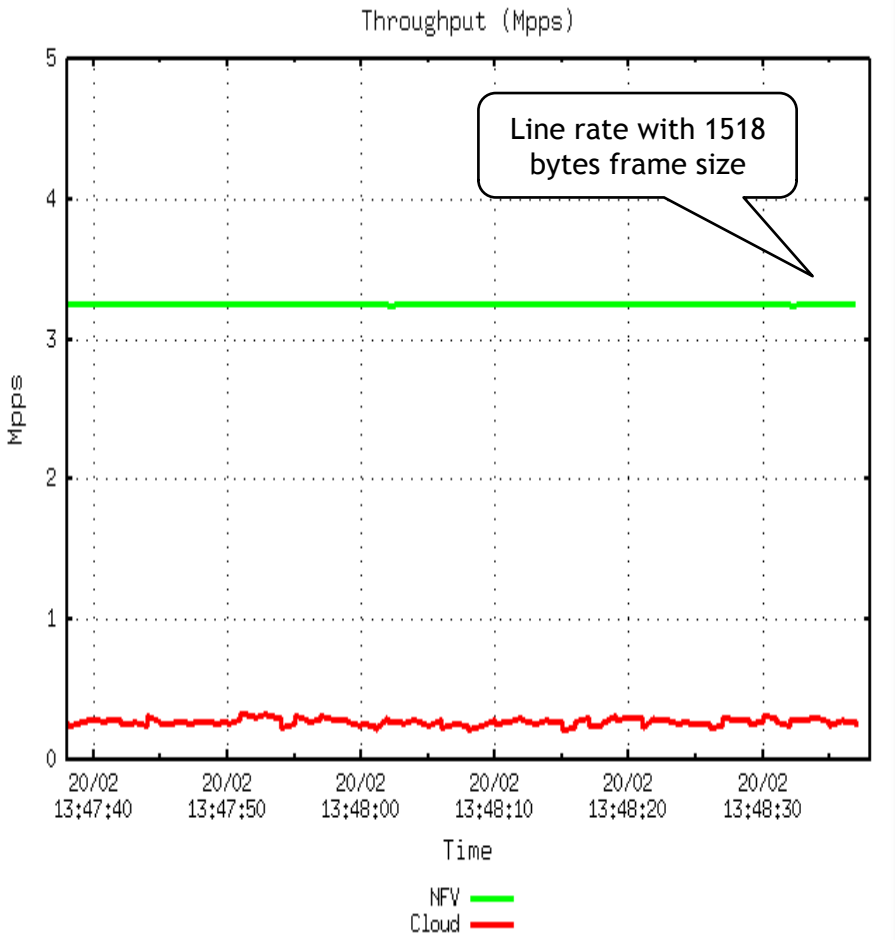
TRADITIONAL CLOUD

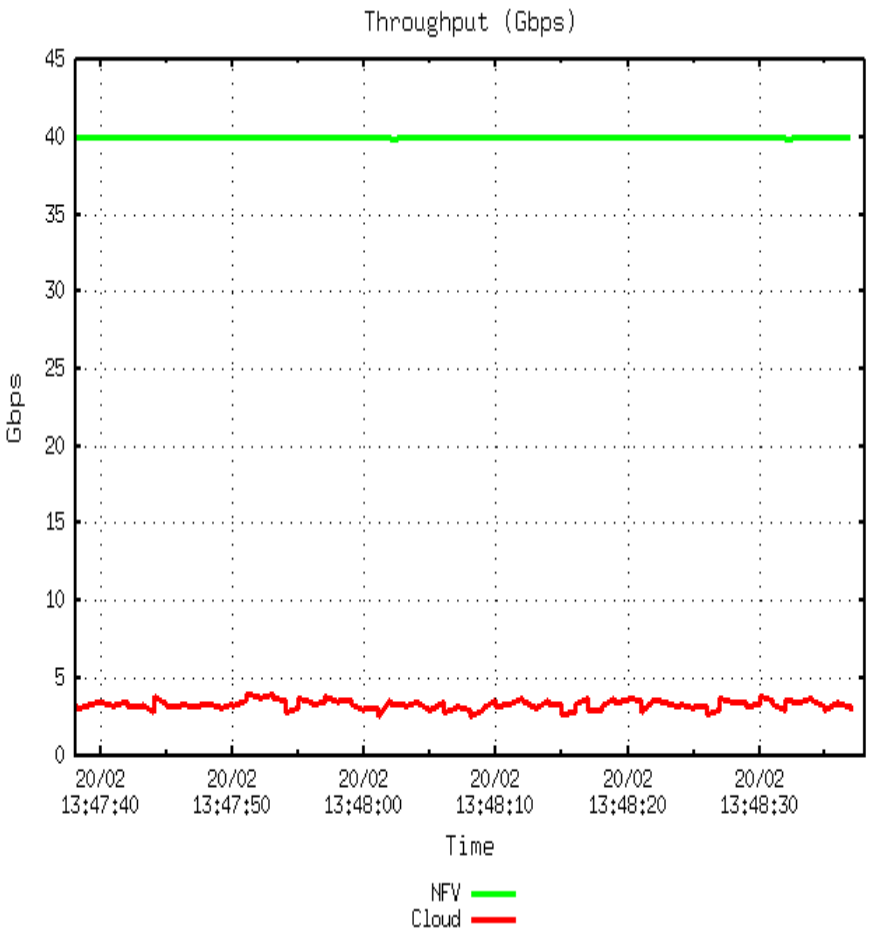
- Cloud Management System acting as VIM
  - No Enhanced Platform Awareness
  - Networks based on vSwitch
- VNF and Network Service Descriptors *à la cloud*

NFV

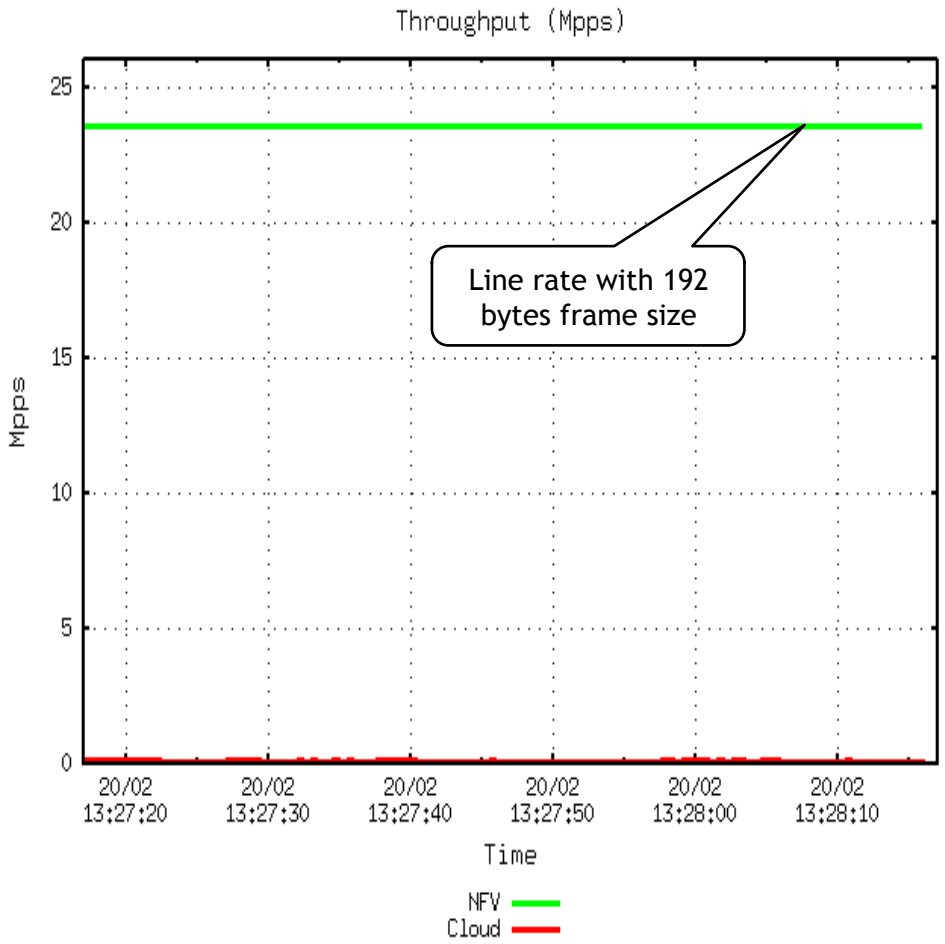
- NFV VIM, platform-aware
  - CPU & NUMA pinning, PCI passthrough, hugepages, etc.
  - Networks based on ToR Openflow switch
- VNF and Network Service descriptors, enhanced with platform-aware fields

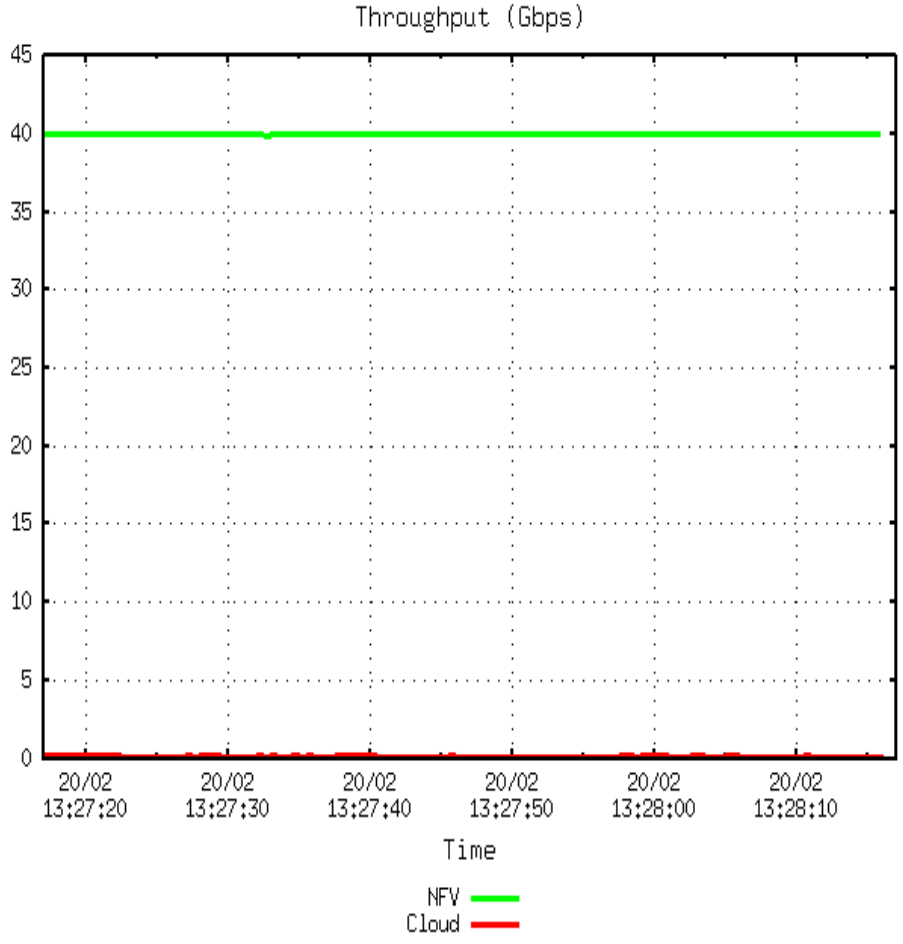
Performance Figures (Large Packets)



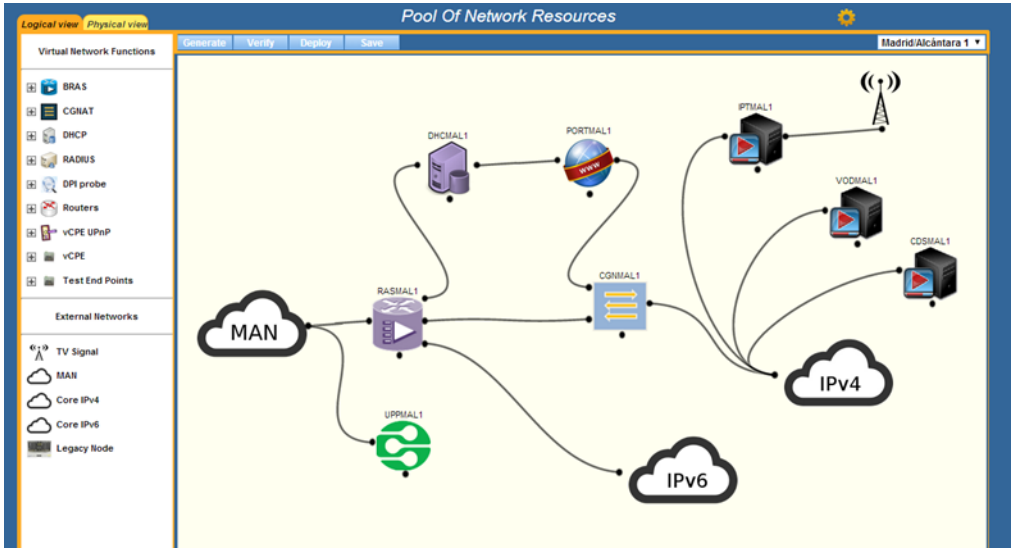


Performance Figures (Small Packets)





OpenMANO: A Dataplane-Ready MANO Stack

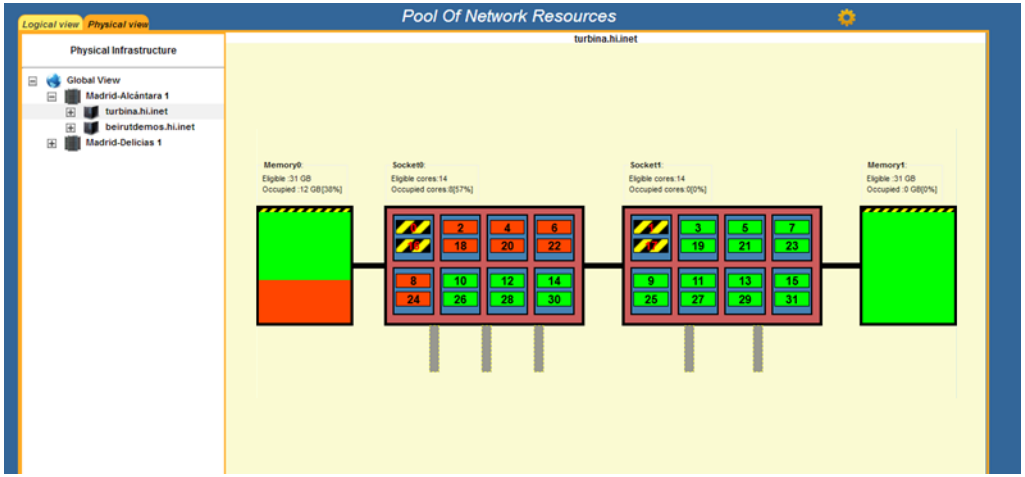


- EPA-aware VIM
  - CPU & NUMA pinning
  - PCI passthrough, hugepages, etc.
  - Network infra defined by Openflow control of external (ToR) switches
- Performance-aware NFVO
  - VNF and NS descriptors, enhanced with platform-aware fields
- Generic VNFM
  - DSL enabled
  - Under development

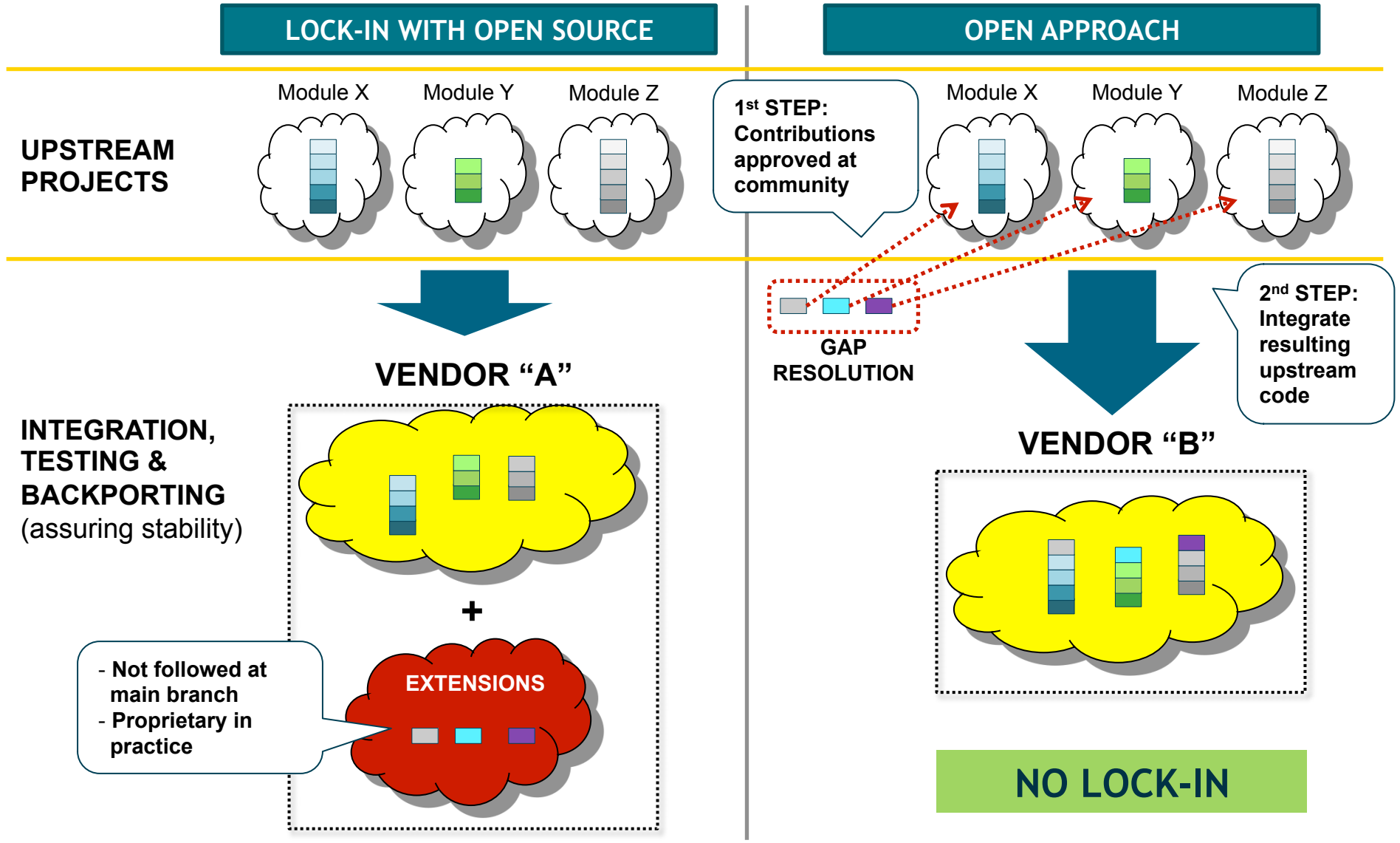
openmano

https://github.com/nfvlabs/openmano

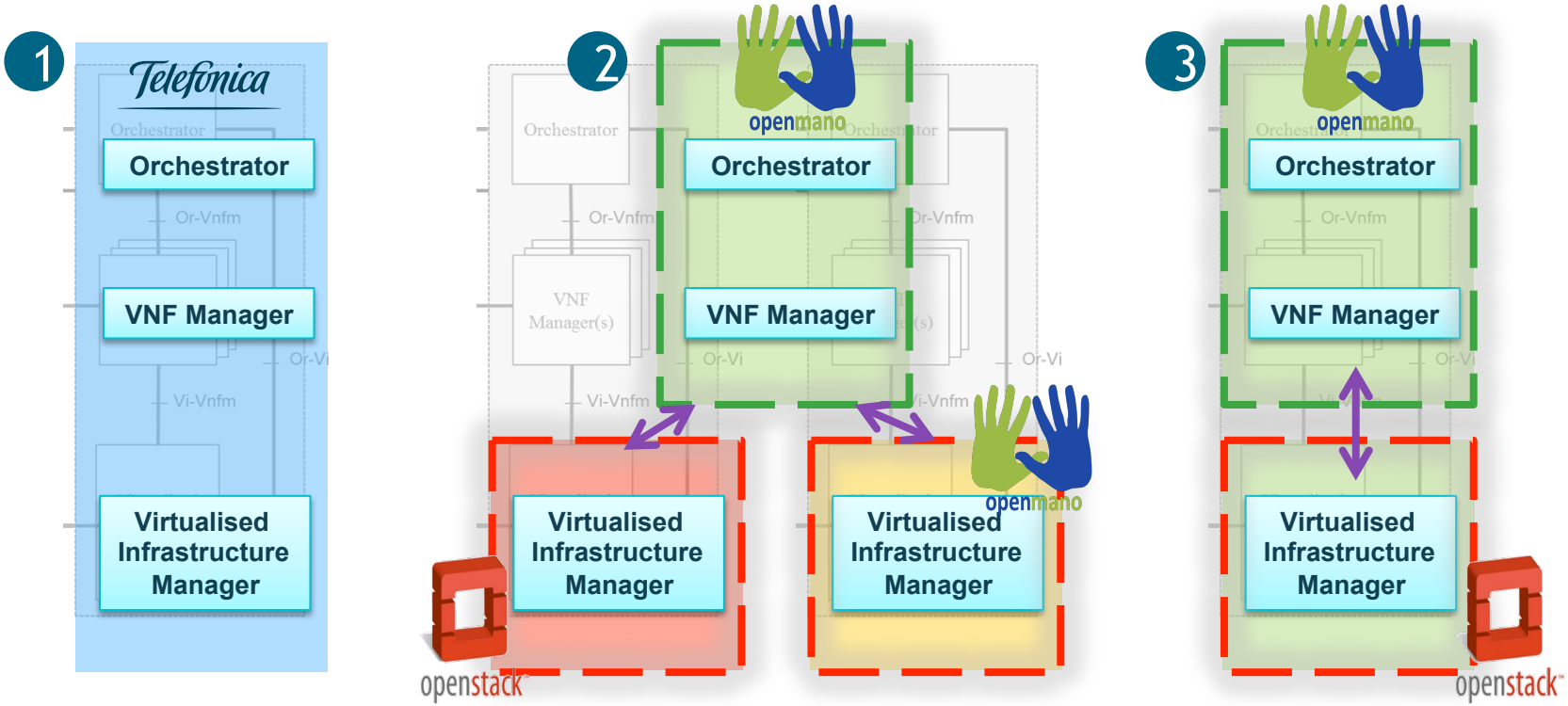
Evaluators and contributors welcome!



The Role of Open Source



Evolving the OpenMANO Stack



In house vertical MANO (2013)

NFVO over vanilla OpenStack

NFVO over OpenMANO VIM

NFVO over enhanced OpenStack