

Telefónica

Network Virtualisation Reference architecture and ecosystem_

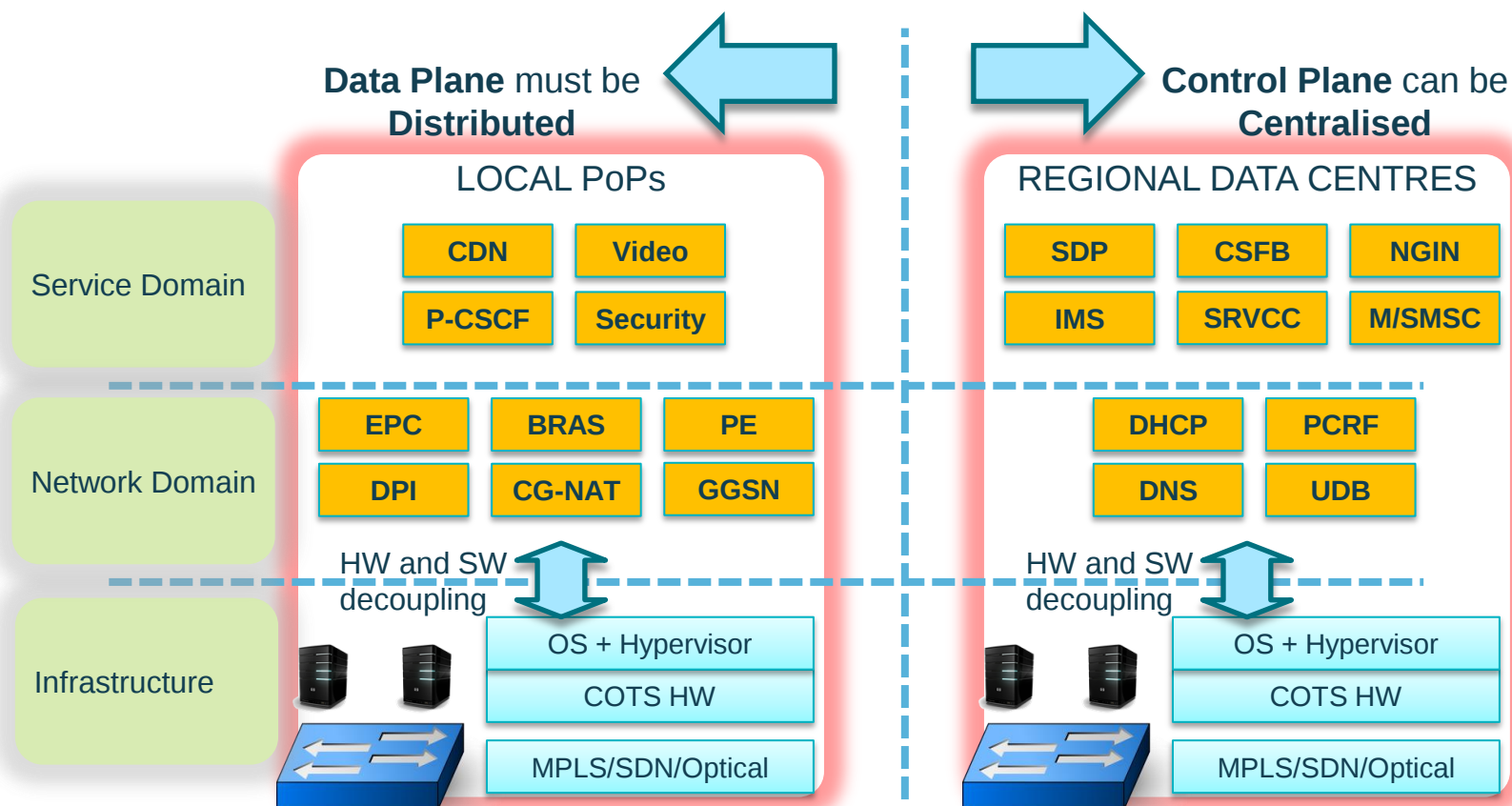
Telefónica I+D @ Global CTO
18.03.2014

BE MORE_



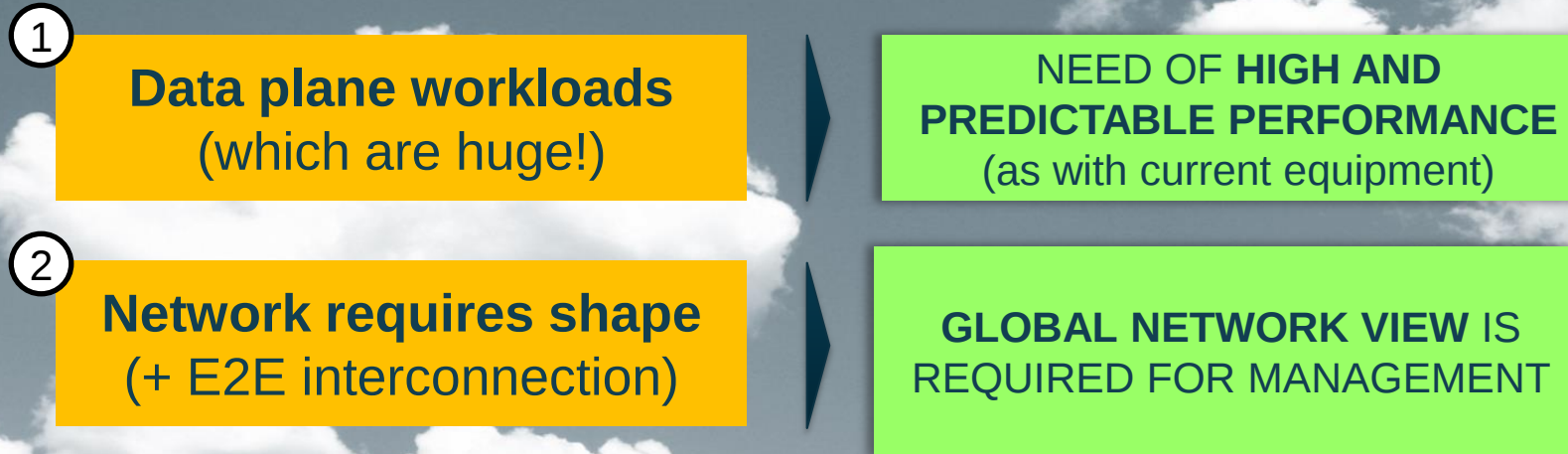
A future-proof network architecture requires distributing data plane intensive functions and centralising control plane ones

There will be two kinds of Virtualized Network Infrastructure: **local PoPs** and **regional Data Centres**



Network Virtualisation is not Cloud Computing

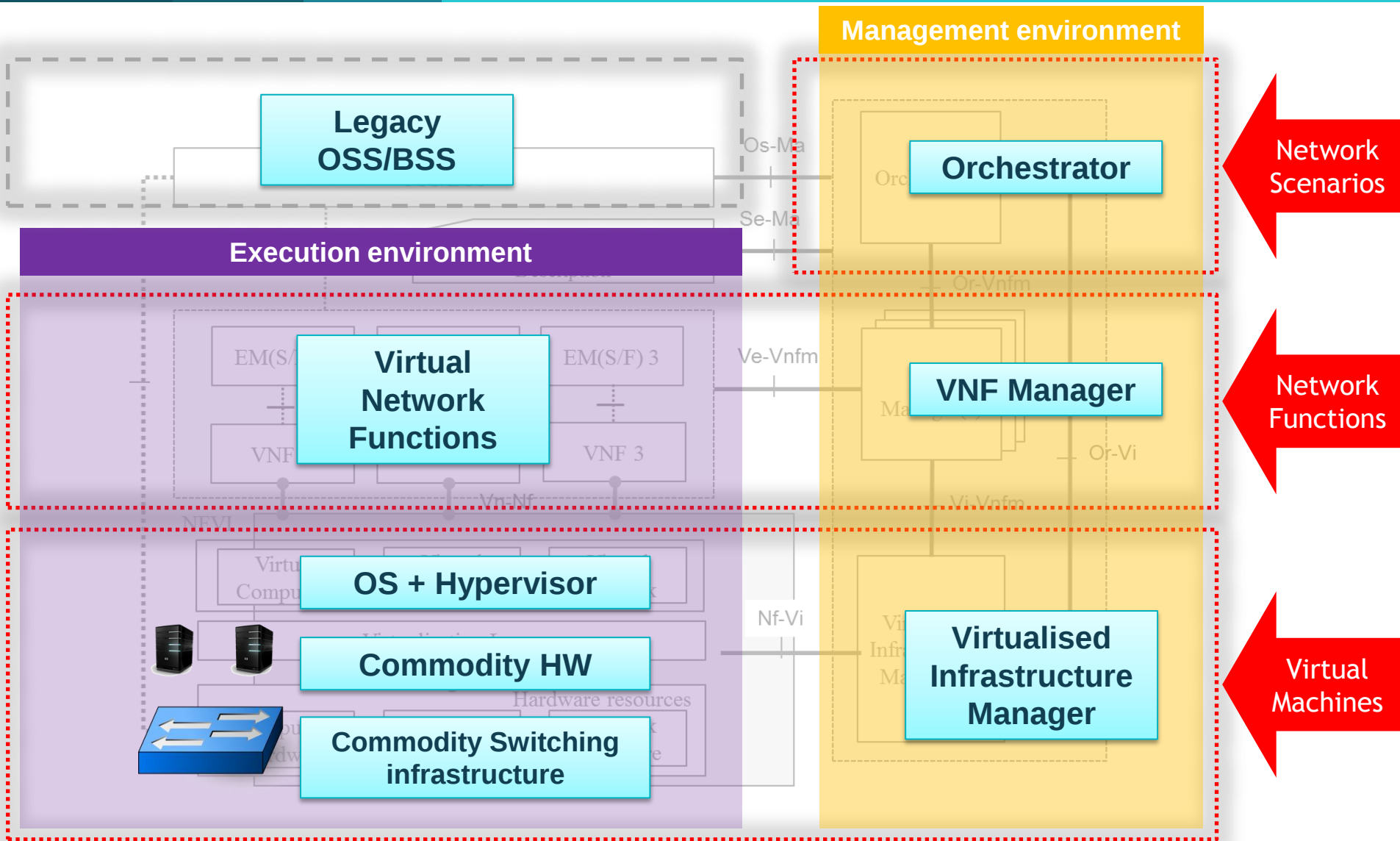
The network differs from the computing environment in 2 key factors:



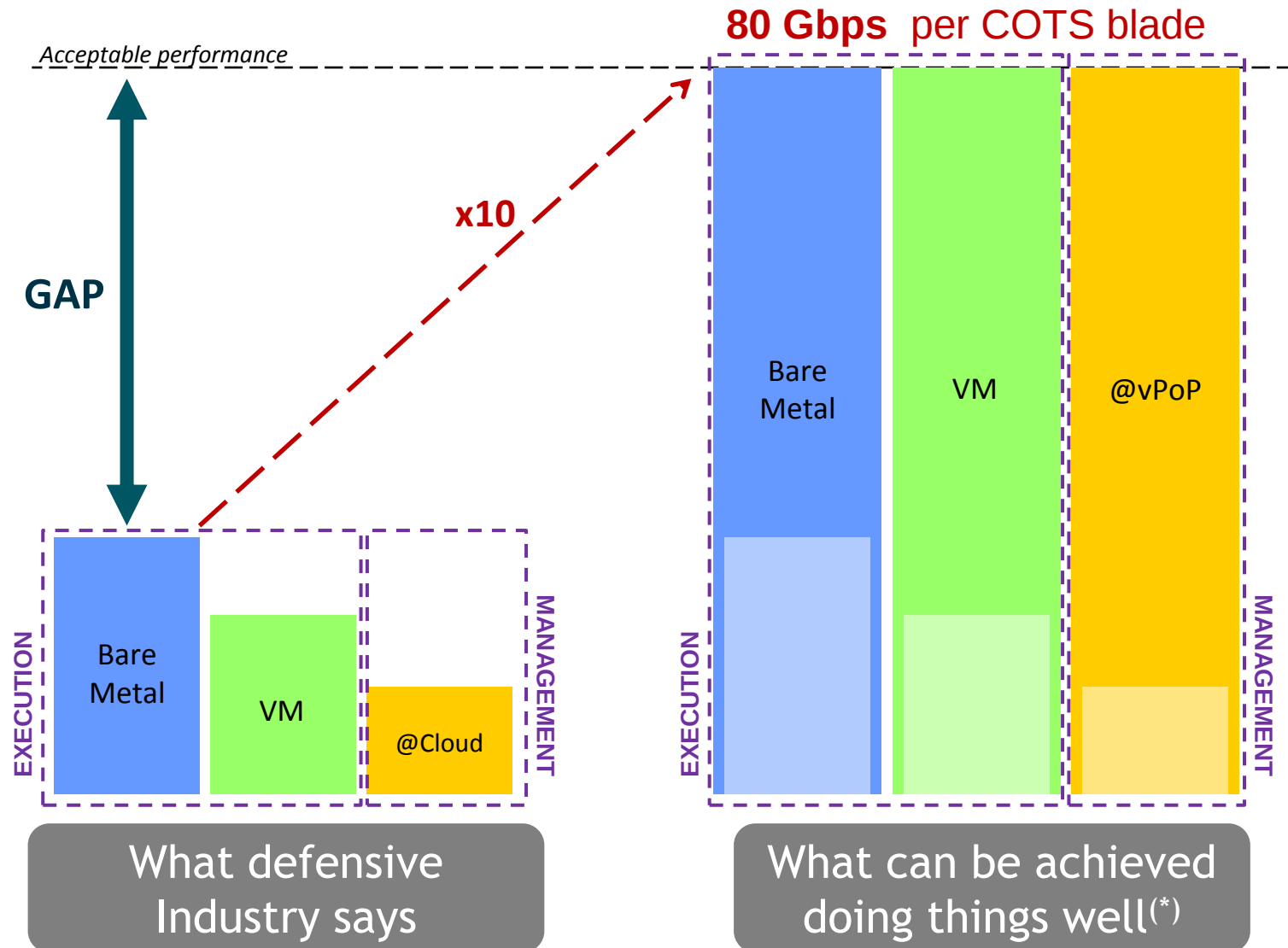
...which are big challenges for vanilla cloud computing

...and most of industry is offering to Telcos just IT based cloud products as network virtualization environments

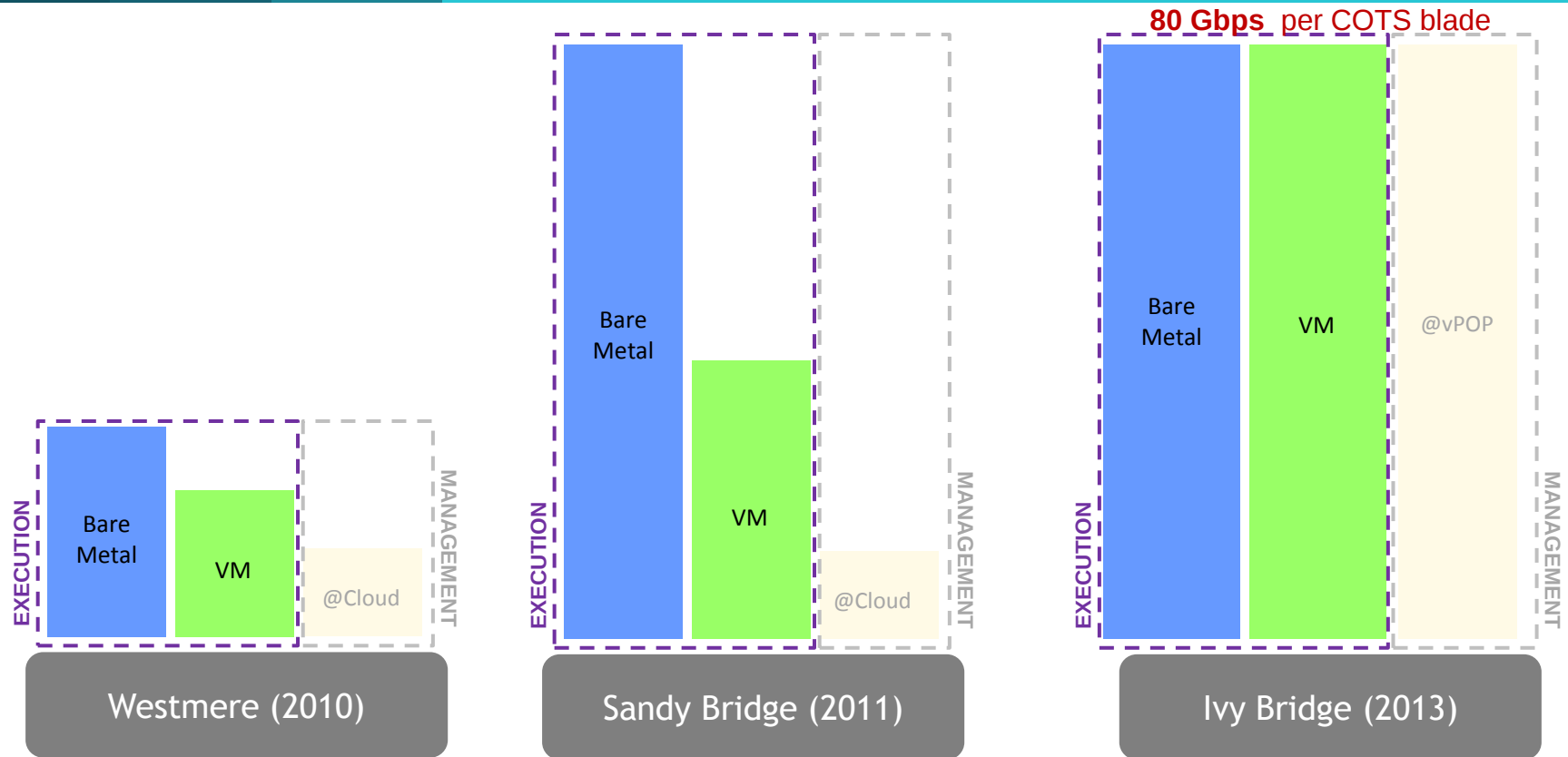
ETSI NFV ISG has generated a reference architecture for ensuring interoperability and carrier grade performance



High and predictable performance is not an issue (e.g. vCPE, vCG-NAT, vBRAS...) as long as you know how!



x86 technology evolves faster than ASIC



BARE METAL

- Direct PCIe connection to the processor
- Direct cache access for I/O
- Large pages support for I/O

VM

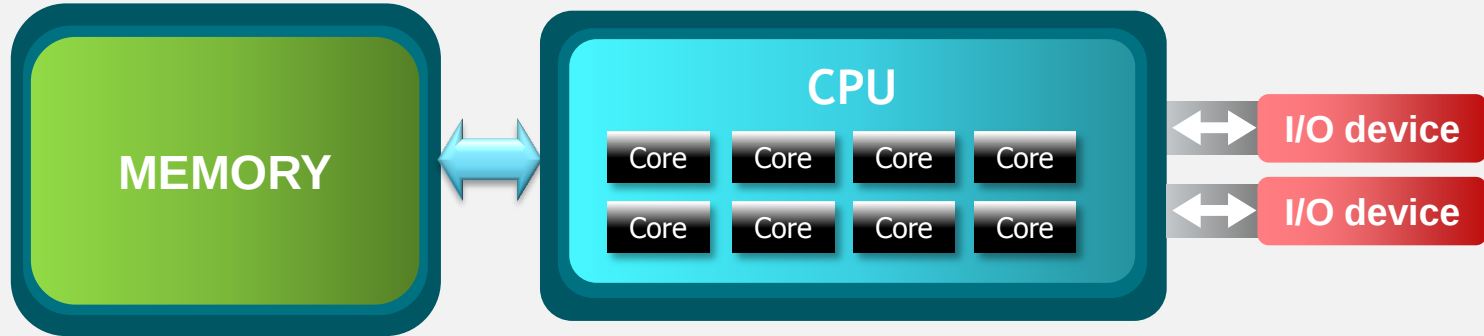
- Support for translations in memory R/W from CPU (small and large pages)
- Support for translations in memory R/W from I/O (only small pages)
- Support of NICs in passthrough

VM

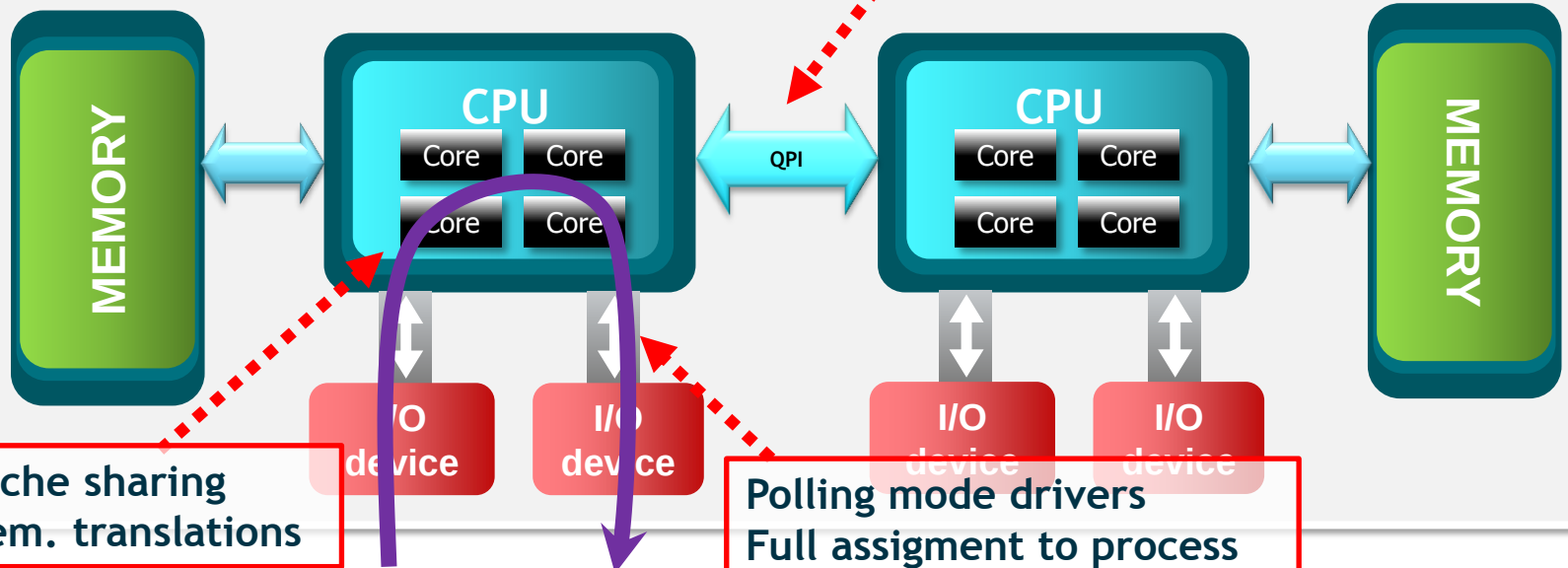
- Support for translations in memory R/W from I/O (large pages)

A more detailed HW visibility is needed...

CLOUD COMPUTING VIEW

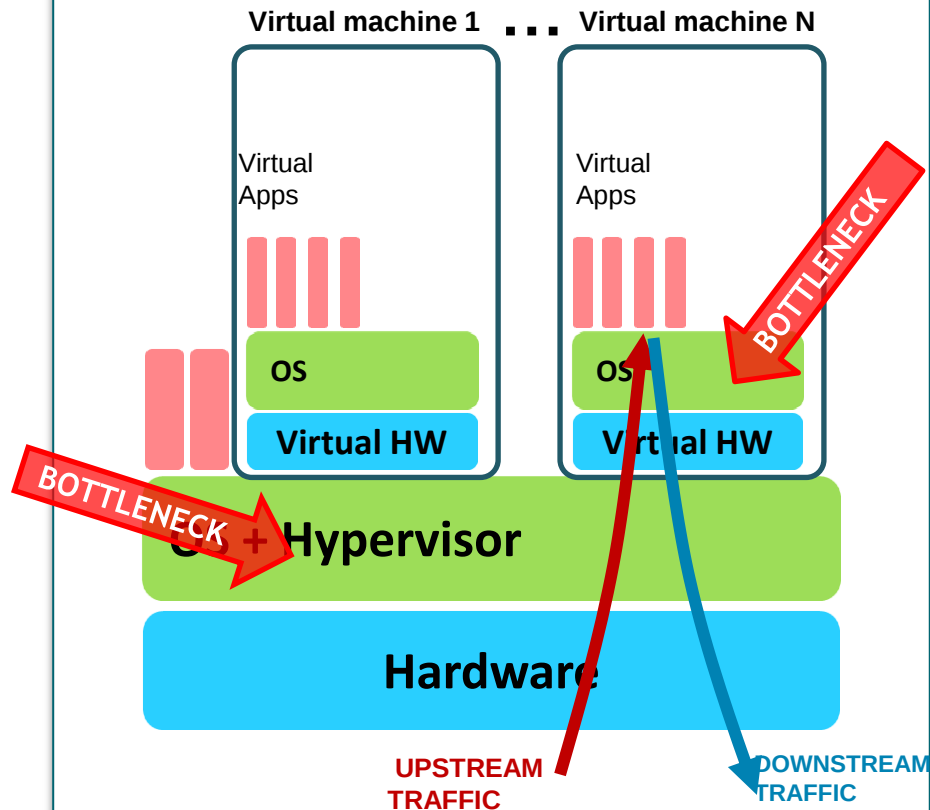


NETWORK VIRTUALISATION VIEW

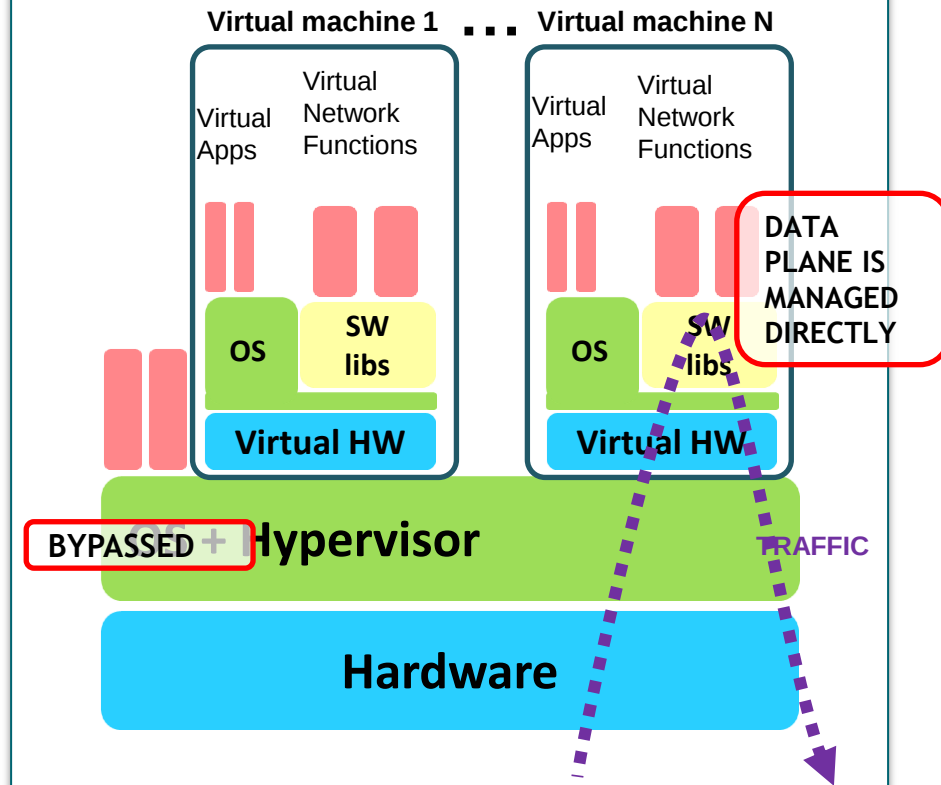


... while server configuration does not add bottlenecks

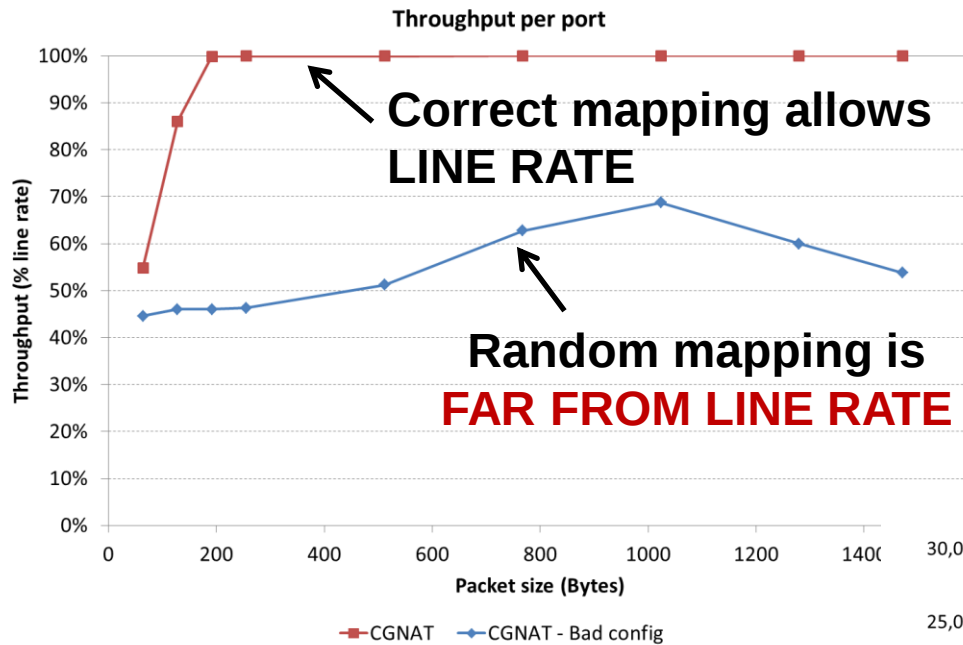
CLOUD COMPUTING



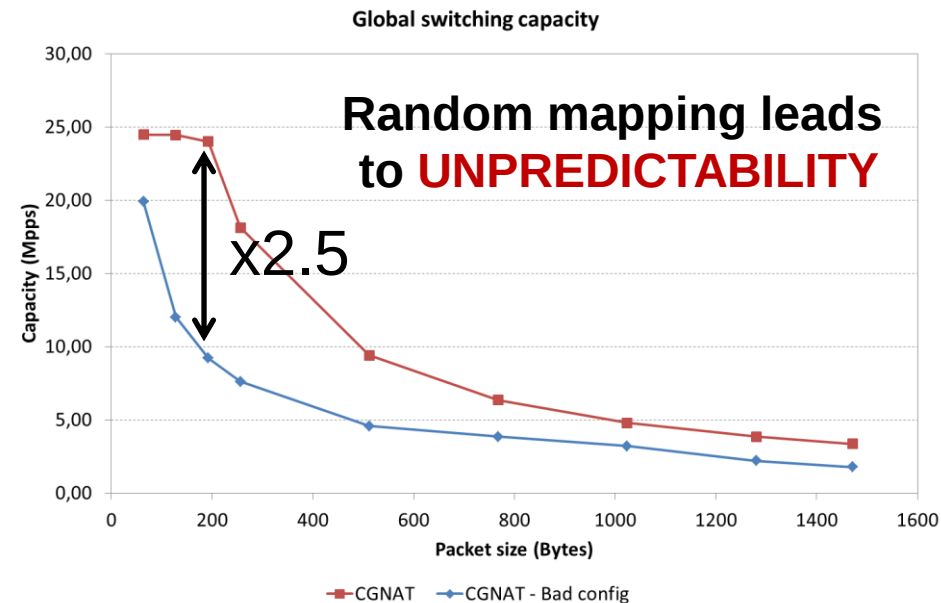
NETWORK VIRTUALISATION



If ignored, “equivalent” deployments would lead to completely different behaviours!



**NETWORK VIRTUALISATION
IS NOT CLOUD COMPUTING!**



Industry's best practices are being set...

Based on the previous results, a **formal list of recommendations** aimed at a “telco datacentre” has been issued.

A formal list of features to be included in the **templates for orchestration** has been elaborated.

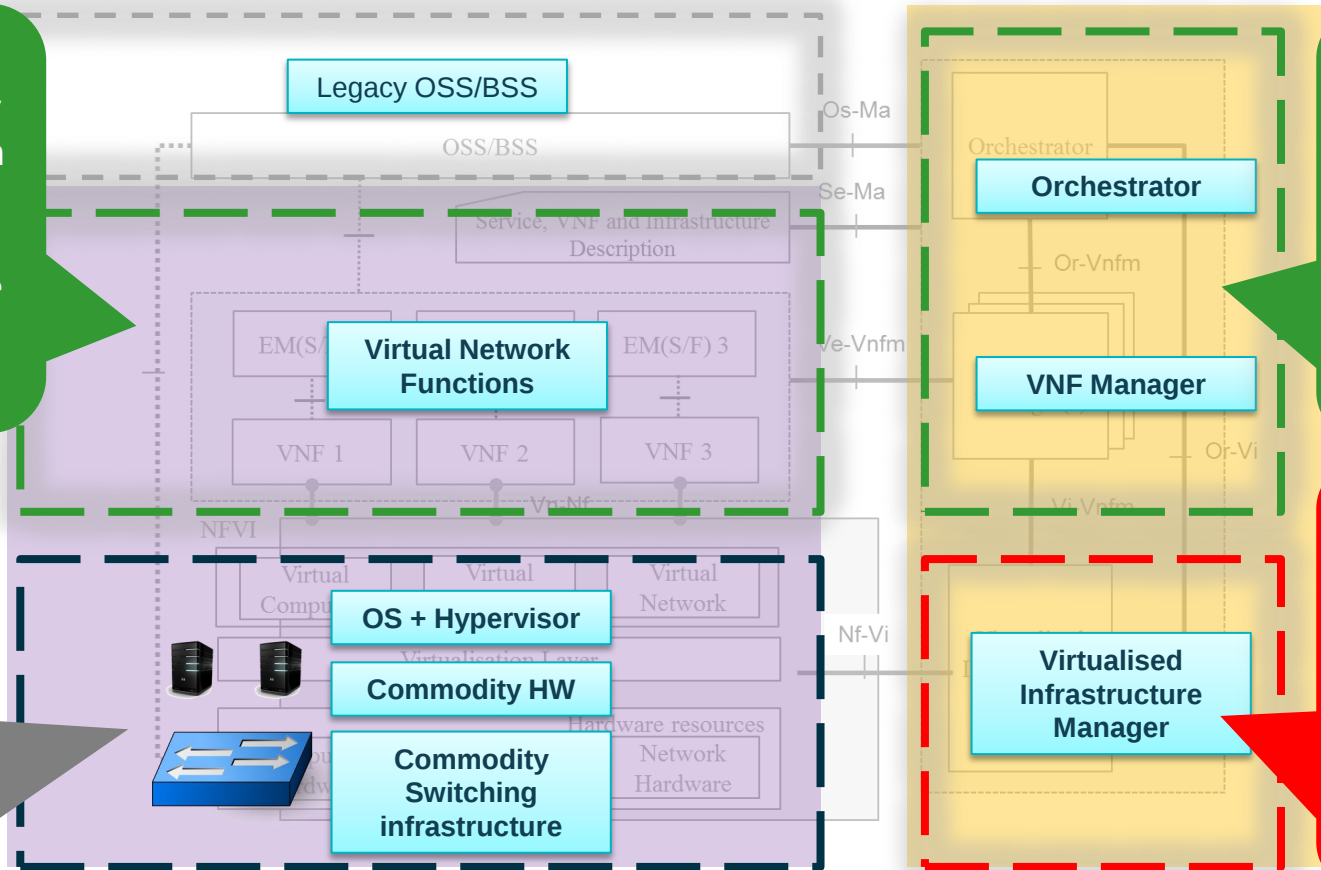
Both are collected in ETSI NFV Work Item
“NFV Performance & Portability Best Practises”:

- [DGS/NFV-PER001](#) Current version: v0.0.7 (stable draft - 15/10/2013)
- **Telefónica** is rapporteur of the draft, as well as chair of Performance and Portability Expert Group.

... but more work is needed on closing the gaps and getting the industry focused on providing real value

ADD VALUE HERE: Industry should focus on providing differential VNFs. Credible **ROADMAP** needed!!

Current State of the Art is good enough (if properly arranged)

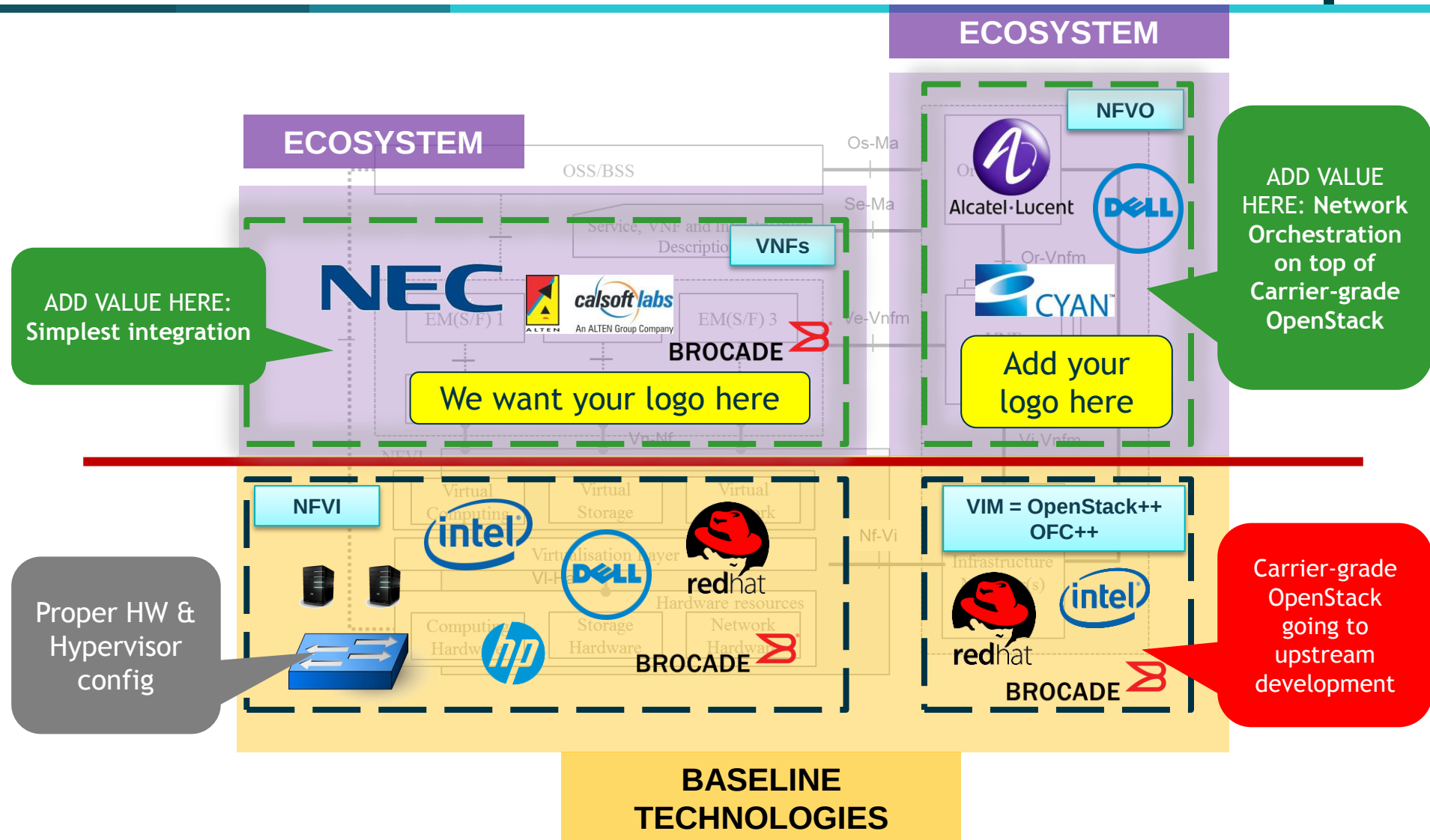


ADD VALUE HERE: Industry should focus on providing differential VNFs and Network Orchestration

Work is needed in Open Source to **AVOID** proliferation of **VERTICAL SOLUTIONS**

Network Virtualisation Infrastructure and its Management should become **COMMODITY**

OUR NEXT STEP: Network Virtualisation Reference Lab @ Telefónica



To introduce gradually and smoothly these changes in our network

It is key to decide **what to virtualize first...**

		Step 1 (2013-2014)	Step 2 (2015-2016)	Step 3 (2016-)
Local Data Centre	Home environment simplification	vCPE vSTB		
	Single IP Edge	vEPC vCG-NAT	vBRAS vPE	vGGSN Unified IP Edge
	Network Intelligence rationalisation	vDHCP vDPI	vPCRF Real Time Network Analytics	
Regional Data Centre	Core simplification and centralisation	vIMS vDNS vUDB	vSDP	
Infrastructure orchestration	IP and photonic coordination	PCE		Net OS: joint orchestration of network resources
	Transport provisioning simplification		SDN Orchestrator	

DISCOVER_

DISRUPT_

DELIVER_

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