



NFV Security Challenges



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François J.N. Cosquer
IP Platforms CTO Security

Note: *The views expressed in this presentation are those of the author and not necessarily those of Alcatel-Lucent Corporation*

WHAT IS NETWORK FUNCTION VIRTUALIZATION?

NETWORK FUNCTION VIRTUALIZATION



Off-the-shelf
server blades



From : Network Elements with dedicated hardware

To: software-based applications running on uniform hardware platforms

ENABLER: VIRTUALIZATION

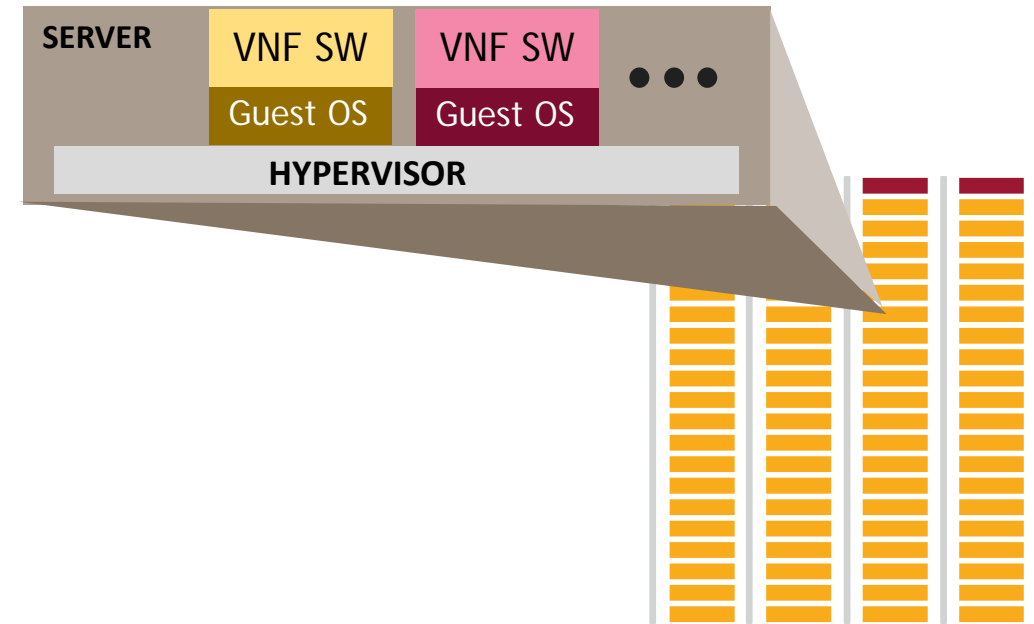
- Virtualization is a technology that makes a single physical server appear as multiple virtual servers ("Virtual Machines") to the software applications
- Hypervisor
 - Schedules Virtual Machines
 - Manages access to resources so that one VM does not interfere with or corrupts resources used by another VM

Servers:

- General Purpose Processors (x86)

Popular hypervisors:

- KVM (open source)
- VMware ESXi/vSphere



Off-the-shelf general purpose hardware

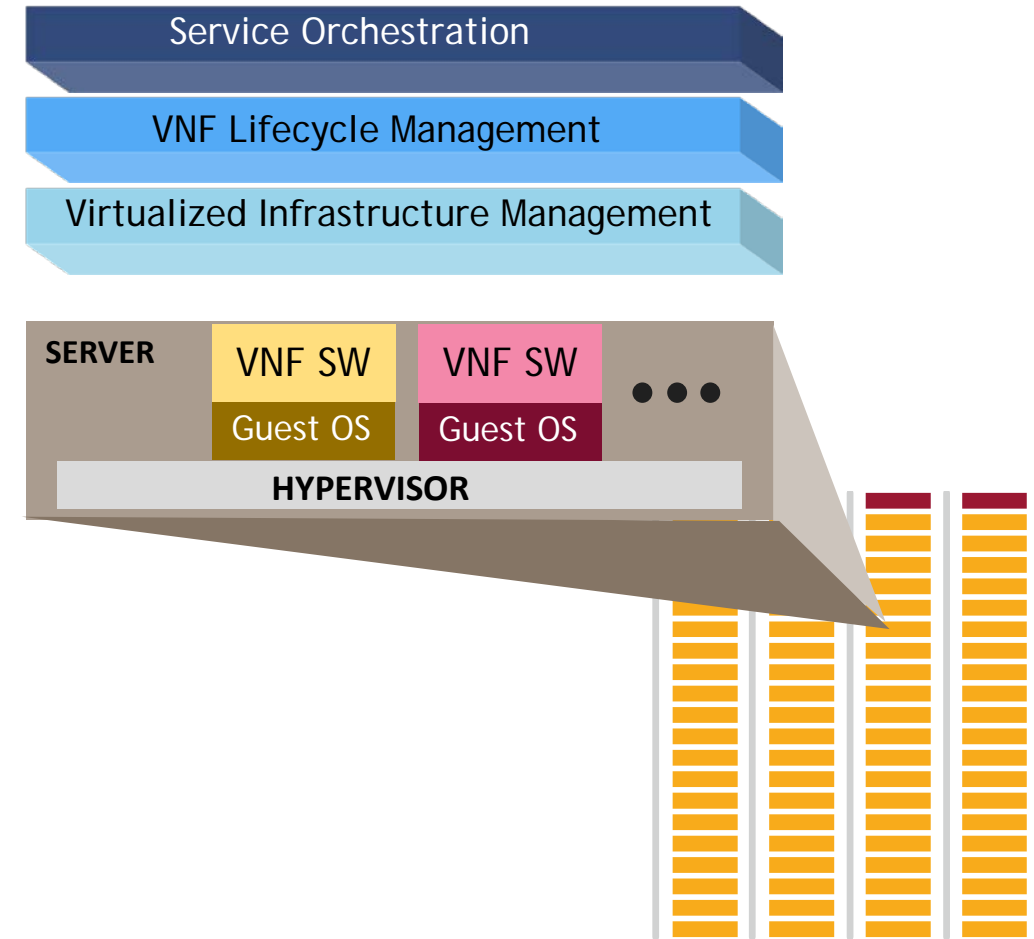
Open-source software

+ NFV MANAGEMENT

- Virtualized Infrastructure Management (VIM)
 - Allocation of compute, storage and networking resources to VNFs
 - Management of hypervisors
 - Fault mgt and alarm correlation wrt to the infrastructure
- VNF Lifecycle Management:
 - Automated creation, scaling, healing, upgrade and termination of VNFs
- Service Orchestration:
 - Creating end-to-end services through chaining and provisioning of VNFs

Popular VIMs:

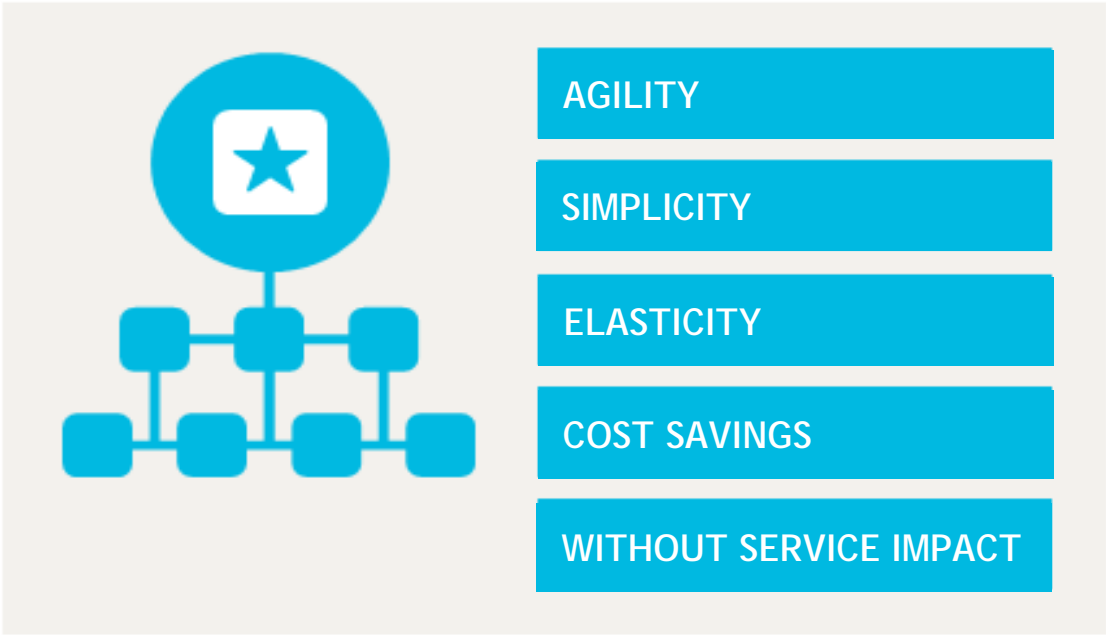
- Openstack (open source)
- VMware vCenter/vCloud



Automation & Agility

MORE THAN VIRTUALIZATION

THE NFV PROMISE

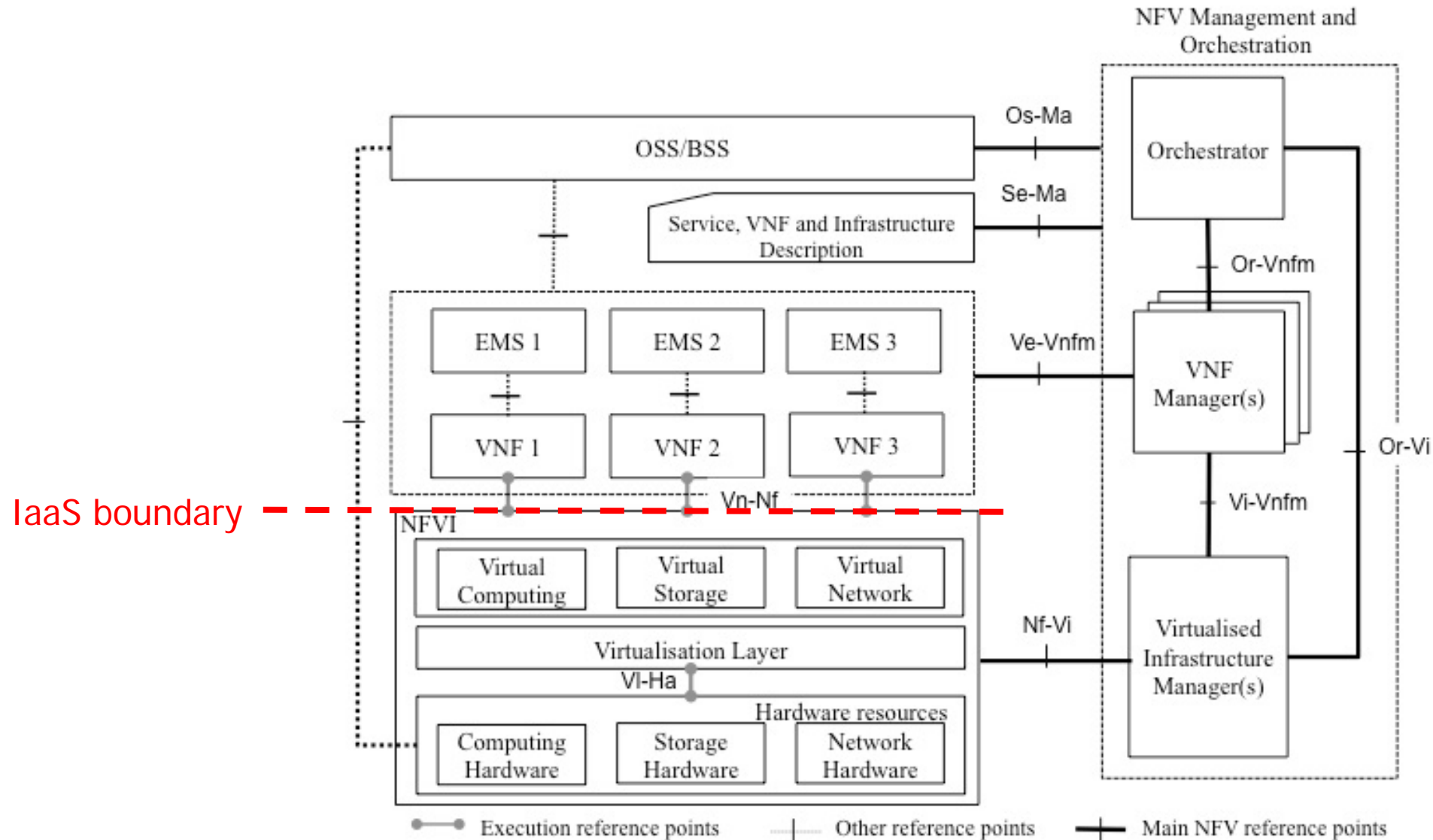


BUT, REQUIRES CHANGE



Bigger gains require bigger investments in tools, processes and cultural changes

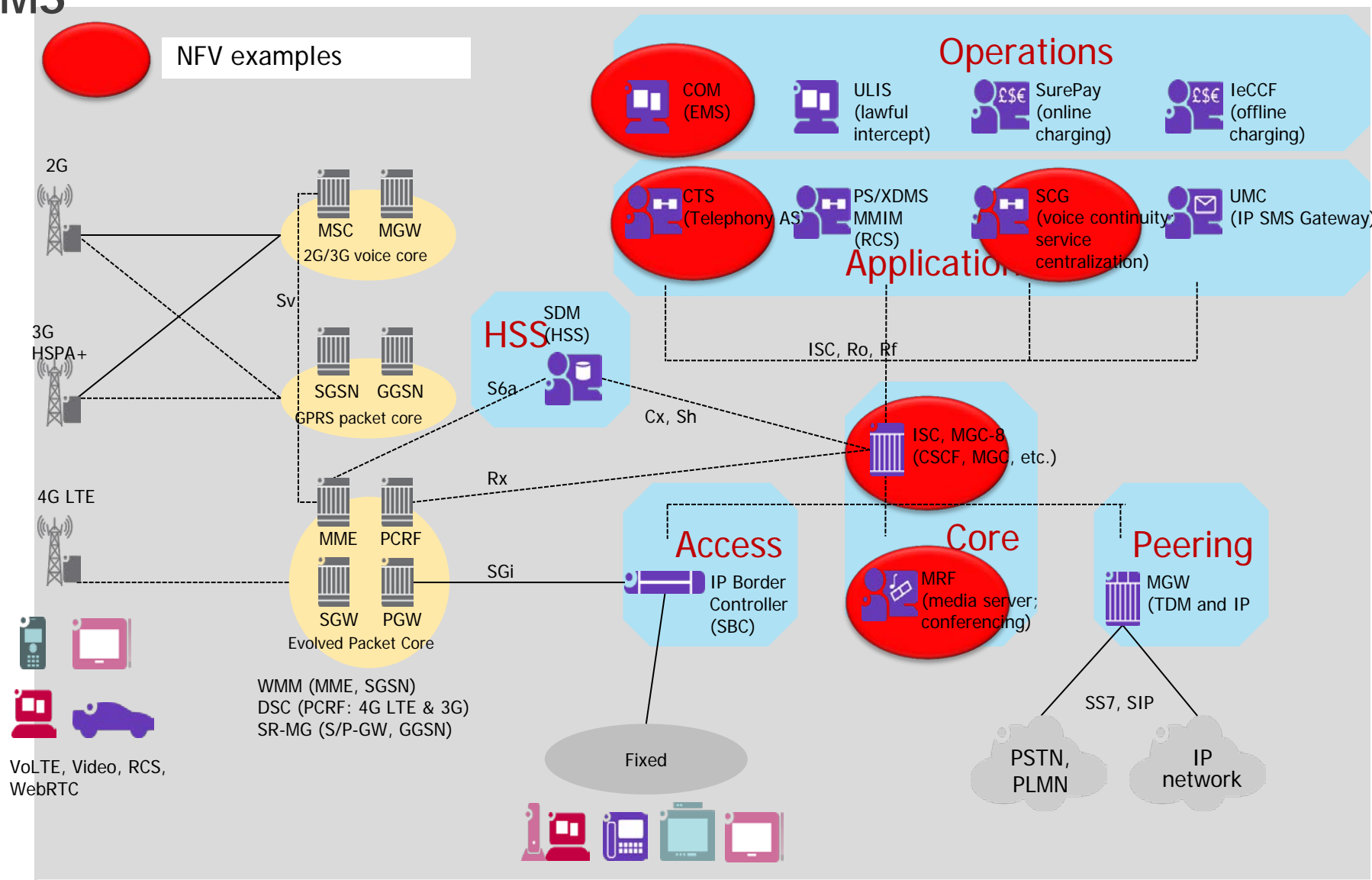
NFV = MIGRATION FROM LEGACY TO « CLOUD » ENVIRONMENT



ETSI NFV ISG

IN PRACTICE

PRACTICE EG. IMS

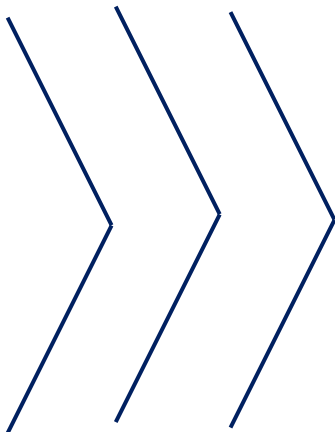


COM : Centralized Operations Manager : Element Management System
CTS : Converged Telephony Server : Telephony Application Server providing the voice services
SCG : Service Continuity Gateway : Application Server providing service centralization and Voice Call Continuity between GSM/UMTS, CDMA
ISC : IP Session Controller : Session manager
MRF : Media Resource Function : Media resource function providing functions such as announcements and conferencing



HARD TO SEE MIGRATION... LEGACY TO NFV

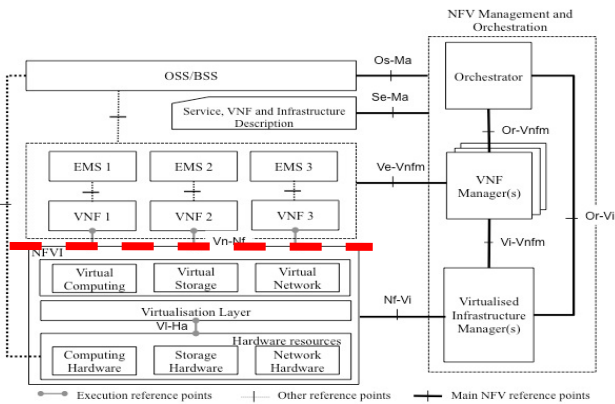
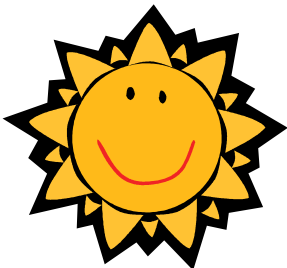
Legacy ATCA implementation



HP C7000 based NFV implementation



NFV REALITY CHECK.. AND SECURITY?



ETSI NFV ISG



Top 5 Migration Risks:

- Isolation
- DoS
- Sec Logs and SIEM
- Topology validation
- Compliance



YOU ARE HERE.



2013

2014

2015



FOR THIS SESSION WE HAVE 3 GREAT SPEAKERS (TOTAL OF 532 YEARS INDUSTRY EXPERIENCE!)

1. Doug Snyder, VERITAS

“Addressing NFV Virtualization Requirements”

2. John Kimmins, Catapult Consultants

“Securing the Evolving Network & Services Virtualized Environment”

3. Jose DeFrancisco Lopez, ALU

“Delivering Lean NFV Ops”

**NFV reality with
requirements... storage**



**Security risk migration
Legacy to NFV/SDN**



**NFV promises with
lean Ops..
Agility, flexibility,
Automation...**