OpenMANO

The Dataplane Ready Open Source NFV MANO Stack

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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!)
2. Network requires shape (+ E2E interconnection)

...which are big challenges for vanilla cloud computing.

AN ADAPTED VIRTUALISATION ENVIRONMENT IS NEEDED TO OBTAIN CARRIER-CLASS BEHAVIOUR
Applying Enhanced Platform Awareness (EPA)

CLOUD COMPUTING VIEW

MEMORY

CPU

I/O device

I/O device

I/O device

I/O device

NFV VIEW

MEMORY

CPU

I/O device

I/O device

I/O device

I/O device

Enable huge pages usage

Max. cache sharing
Min. mem. translations

Minimise QPI usage

Polling mode drivers
Full assignment to process
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)

Line rate with 1518 bytes frame size
Performance Figures (Small Packets)

Line rate with 192 bytes frame size
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

https://github.com/nfvlabs/openmano

Evaluators and contributors welcome!
The Role of Open Source

**LOCK-IN WITH OPEN SOURCE**

**UPSTREAM PROJECTS**

Module X  
Module Y  
Module Z

**INTEGRATION, TESTING & BACKPORTING**

(assuring stability)

**VENDOR “A”**

- Not followed at main branch
- Proprietary in practice

**EXTENSIONS**

**OPEN APPROACH**

Module X  
Module Y  
Module Z

1\textsuperscript{st} STEP: Contributions approved at community

**GAP RESOLUTION**

2\textsuperscript{nd} STEP: Integrate resulting upstream code

**VENDOR “B”**

**NO LOCK-IN**
Evolving the OpenMANO Stack

1. In house vertical MANO (2013)

2. NFVO over vanilla OpenStack

3. NFVO over enhanced OpenStack