NFV Tutorial and Demo Session
Welcome and Introduction

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Goals & Agenda

• This session provides a high level introduction to the ETSI NFV work
  – Broadcast and recorded for posting on line

• ETSI NFV founded in October 2012
  – Founding operators published a paper which introduced “NFV” for the first time
  – Now over 300 companies including 38 network operators, vendors and academia
  – Over 80,000 participant-hours in 18 face-to-face plenary meetings spanning the globe

• ETSI NFV foundation specs are being referenced globally
  – ETSI NFV co-founders created OPNFV to encourage carrier-grade open source solutions for OPNFV

1415   NFV Tutorial Session
1545   Coffee Break
1600   API Overview and Demo
1800   Close
About CableLabs

• Global membership-based innovation and R&D lab for cable operators
  ✔ 59 members serving >150M end users globally
  ✔ Offices in Louisville-CO and Sunnyvale-CA

• Active contribution to international standards and open source
  ✔ DOCSIS® technology developed & specified at CableLabs

• Advancing cable technology and exploring new applications
  ✔ DOCSIS network evolution (full-duplex, coherent optical)

• Our innovation time horizon is 3-8 years
  • Creating a multibillion dollar impact for the global cable industry over the next decade
Skillfully connecting the startup world to the vast global cable network:

- The UpRamp ‘Fiterator’ accelerator designed to bring later stage startups true product fit within the global cable/broadband/wireless industry
- Innovation Showcases
- Technology Tours
- And more…
- Info: https://www.upramp.com/
Kyrio SDN-NFV Interop Lab

Kyrio is the commercial arm of CableLabs

- Industry is past PoC, now we are in Interop
- Leverage CableLabs’ testing experience
- Reference implementations
- Recent demos:
  - Virtual CMTS
  - SD-WAN
- Open to non-cable

www.kyrio.com
CableLabs NFV Focus

• Focus is on virtualizing the cable network edge
  – Head-end (technology agnostic provisioning)
  – Distributed DOCSIS network
  – Customer environment

• Aligning virtualization architecture to be applicable to global cable industry
  – Disseminating best practices for carrier-grade virtualization at the edge
  – Maximizing economies of scale for everyone

• Emphasis on open standards and open source
  – ETSI NFV, OPNFV, OSM, OpenStack, ODL, …
  – We don’t evaluate proprietary solutions
Ecosystem Interdependency

How to avoid fragmentation?

Industry Forums

Open Source

Standards

Academia

Operators

Vendors

Requirements

Specs

Validation

Deployment

Research / Skills

Implementation
NFV Interoperability Challenge

- VNFs and VNF Managers from diverse sources
- NFV Orchestrator could be open source, vendor-proprietary or operator-proprietary
- VIM could be OpenStack, CloudStack, OpenNebula, …, or Proprietary
- How to ensure interchangeable NFV components if common interface specifications are not mandated?
- ETSI NFV has specified most of the interfaces in this diagram after 4-years of consensus building on technical rationale
- Enables conformance testing and real interoperability tests to begin
- ETSI NFV Plugtests in January 2018
Standards & Open Source are Complementary!

Standards

Pros
• Universally accepted specification that can be referenced globally
• Community learning by sharing rationale
• Discourages vendor lock-in
• Recognized authority
• Clear licensing model
• Capable of addressing “Security by Design”

Cons
• Time to analyze technical impacts and feasibility and develop consensus
• Implementation feedback cycle is too long
• Difficult to align domain-specific standards organizations to create compatible specs.
• Barriers to participation for small players
• Culture resistant to change

Open Source

Pros
• Bypasses consensus reducing time to implementation
• Fast bug fixes, and improvements
• Community development
• Low barrier to participation

Cons
• Lacks recognized/persistent authority
• Uncertain delivery timescales for given feature set
• Feature persistence from release to release -- what constitutes “normative” in open source code?
• Risk of vendor lock-in through forking
• Uncertain licensing model
• Difficult to address “Security by Design”
• Culture -- hard to manage individual developer contributions
• Vulnerable to fragmentation into multiple communities

Validation
Why ETSI NFV is Important

Avoiding fragmentation...

Open innovation, the best of both worlds...

Foundation NFV Standards - the basis for openness & interoperability!