UNIFYing carrier and cloud networks:
mixing SDN and NFV

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SDNRG@IETF91, November 10, 2014
Agenda

- Motivations
- Related Work
- UNIFY
  - Value proposition
  - Approaches
  - Architecture proposal
  - Highlights
- Summary
Motivations

“Today, rigid network control limits the flexibility of service creation”
Related Work: SDN & NFV

- SDN supports
  - multi-level virtualization
  - Control – data plane split
- NFV
  - Appliance-based NF to Virtualized NFs
UNIFY’s Value Proposition

- Rapid & Flexible Services (Processing Anywhere)
- Network Function Chaining as a Service (Open Innovation Environment)
- Resource Orchestration & Traffic Steering
- ALL Infrastructure Options (Network, Cloud & SP-DC)

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Approach: Virtualization (up)

- Big Switch & Big Software (BiS-BiS) Virtualization
- Combined compute, storage and networking
- Virtualized “infrastructure view”
Approach: Service Requests (down)

- Network Function Forwarding Graph (NF-FG)
- Combined software (NF) and forwarding overlay definition
- Mapped to the “virtualized infrastructure”
Service: Resource Orchestration with

- Isolation and
- service guarantees per NF-FG
Architecture

- NF-FG @
  - Sl-Or, Cf-Or, Or-Ca
  - Multi-level (recursive)

- A combination of NFV & SDN
1. The UN can host VNFs as **full VMs**, **lightweight isolated containers** or **enhanced logical switch instances**

2. Intel® DPDK is used to achieve **high performance** in the UN Virtual Switching Engine as well as optionally in the various VNFs.

3. VNFs of the incoming NF-FG are logically mapped to the internal network and to traffic steering between the VNFs.
Highlights: SP-DevOps

- Analyze applying DevOps principles for telecom software-defined infrastructure
- Develop a set of APIs for the UNIFY Architecture, common to Developer and Operator roles
- Build an integrate tools addressing specific research challenges
  - Scalable monitoring
  - Forwarding plane verification
  - Network debugging as a service

“Service Provider DevOps for Software-Defined Telecom Infrastructures” draft-unify-nfvrq-devops @NFVRG
Highlights: Proof of Concept Demos
SIGCOMM 2014
2 x EWSDN 2014

Multi-Layered Service Orchestration in a Multi-Domain Network Environment

Demo Set-up

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Summary

• UNIFY: solution for rapid and flexible services
• see NFVRG@IETF91
  • "Unifying Carrier and Cloud Networks: Problem Statement and Challenges"
    draft-unify-nfvg-challenges
  • For a joint programmatic interface for compute, storage and network resources
  • “Service Provider DevOps for Software-Defined Telecom Infrastructures”
    draft-unify-nfvg-devops
  • For VNF and Service Developer support in the UNIFY programmable infrastructure
UNIFY Consortium
2013 November - 2016 April

Major Vendors:
- Deutsche Telekom
- Ericsson
- Intel

Major Service Providers:
- Telecom Italia
- OTE

SMEs:
- travelping
- BISDN

Research Institutes:
- iMinds
- SICS

Universities:
- MÜEGYETEM 1782
- Universidad del País Vasco
- Euskal Herriko Unibertsitatea

Project Management:
- eICT

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