

**PERFORMANCE**  
**FOR SOFTWARE DEFINED AND**  
**VIRTUALIZED ECOSYSTEMS:**  
**On Going Efforts by SDOs**

Mohammad Asad Rehman Chaudhry

Vice Chair: Performance IEEE SRPSDVE Study Group  
University of Toronto  
masadch@ieee.org

# Complementary On-going Efforts by Other SDOs

- Internet Engineering Task Force (**IETF**)
- Open Networking Foundation (**ONF**)
- The European Telecommunications Standards Institute (**ETSI**)

# Internet Engineering Task Force (IETF)

# IETF RFC 7149

- Internet Engineering Task Force RFC 7149
- March 2014
- **Software-Defined Networking**: A Perspective from within a Service Provider Environment
- Aims to clarify the **SDN landscape** by providing a perspective on requirements, issues, and other considerations about SDN
- Not meant to endlessly discuss what SDN truly means but rather to suggest a **functional taxonomy** of the techniques

# IETF RFC 7149 (Contd.)

- The **separation of the forwarding and control planes** (beyond implementation considerations) has almost become a gimmick
  - Technically, most of the current router implementations have been assuming this separation for decades:
    - **Routing** processes (such as IGP and BGP route computation) have often been **software** based, while **forwarding** capabilities are usually implemented in **hardware**

# IETF RFC 7149 (Contd.)

- **Flexibility:**
  - E.g., ability to accommodate short duration **extra bandwidth** requirements
- Techniques for the **dynamic discovery** of network topology, devices, and capabilities
- **Dynamic feedback** mechanisms

# IETF RFC 7149 (Non-goals)

- Fully **flexible** software implementations
- Fully **modular** implementations
- Fully **centralized** control

# Open Networking Foundation (ONF)

# Open Networking Foundation

- **Extensibility** Working Group
  - Developing **extensions** to the OpenFlow
- **Forwarding Abstractions** Working Group
  - OpenFlow on **hardware forwarding** targets
  - **Hardware Abstraction** Layer specifications
- **Optical Transport** Working Group
  - SDN and OpenFlow standard-based control capabilities for optical transport networks

# Open Networking Foundation (contd.)

- **Wireless & Mobile** Working Group
  - Collect **use cases**
  - **Architectural & protocol** requirements for extending ONF based technologies to wireless and mobile domains

# Open Networking Foundation (contd.)

- **Testing & Interoperability** Working Group
  - Accelerate the development and adoption of the OpenFlow standards
- **OF-Config** Working Group
  - Operations, Administration, and Management issues with the OpenFlow

# The European Telecommunications Standards Institute (ETSI)

# ETSI NFV Industry Specification Group Phase 2

- Intensified **collaboration** with other bodies
- Testing and validation to encourage **interoperability** and solidify **implementations**
- Definition of **interfaces**
- Establishment of a **vibrant NFV ecosystem**
- **Performance** and **assurance** considerations