

# SOFTWARE DEFINED AND VIRTUALIZED ECOSYSTEMS PERFORMANCE GAP ANALYSIS

Mohammad Asad Rehman Chaudhry  
masadch@ieee.org

# Current State

- **New Standard** almost every year
  - Silicon has longer developmental cycle
- **Claim:** Less standardization to make things easier but has a counter effect
  - Too much to be figured out before doing something useful

# Gap Analysis - 1

- End-to-end operation
- Level of abstraction
- Coupling between Apps and Resources
- Hardware standardization relatively slow
- Extent of granularity of control
- KPIs
- Scalability

# Gap Analysis - 2

- Interoperability
- SLAs
- Isolation “True End-to-End”
- Live migration
- Hypervisor level migration
- Transient effects
- QoS vs. QoE
- Network locality vs. Across different domains

# Gap Analysis - 3

- **Promise:** Applications control network services without need to know network equipment specificities
  - Not True
    - Switches, although claiming, do not support many parameters
    - QoS Support
      - L2 vs. L3
    - Installing a flow entry in OpenFlow 1.3

# Gap Analysis - 4

- **Interoperability** SDN/non-SDN
  - Some switches have just one option
- **Certification** of compliance
  - Hardware does not support the version that it claims
- Need for a **testbed**

# Gap Analysis - 4

- Network **not local**
  - Controller and switch might be far apart
  - Smart Grid SDN for PMUs, IEDs
    - IEDs and PMUs span a geographically wide area
    - Need something intelligent than overlay multicast
  - Group Tables OpenFlow
    - Limited by matching rules

# Tradeoffs

- **Security and Reliability vs. Performance**
  - **Heartbleed** issue and SDN
    - Open Vswitch
      - Open SSL
      - TLSv1 (similar to SSL3)
- **Critical Infrastructures**
  - **Utilities**
    - Availability vs. other KPIs



# Road Ahead

- **Prioritize** and Focus
- **Use Cases**
- **Complementary** to other SDOs