Network Functions Virtualization (NFV)

Breakout Session

Moderators: K. K. Ramakrishnan (UC Riverside)

Sonia Fahmy (Purdue U)

Participants: George Kesidis, Xiaojun Lin, Srinivas Narayana, Jeff Reed, Edmund Yeh, Murat Yuksel

Use Cases and Requirements

- Many current uses in provider environments, e.g., security and cellular EPC
- Key requirement from the user perspective: Tight latency, e.g., 1 ms
- Future use cases:
  - 5G
    - Example: Vehicular safety
  - Edge computing
  - SD WANs
  - Infrastructure support, e.g.,
    - Power grid control
    - Factory automation
  - Network monitoring and firewalling
    - Smart NICs, P4
  - Slicing and customization

Major Challenges

- Security and isolation
  - Larger attack surface
  - How to verify the integrity of functions?
  - How to achieve performance isolation at low cost?
- Function placement
  - Current solutions do not scale and assume significant global knowledge
  - Need to consider security, privacy and trust goals
- Stateful functions and service function chaining
  - Complex to synchronize state and be fault tolerant
  - When to consolidate and split state?
  - How do data and control plane functions interact?
  - When and how to scale out?