IEEE ComSoc
Network Intelligence
Emerging Technology Initiative

IETF 106, Singapore, November 2020

NMRG57

Network Intelligence ETI

- New community and initiative focused on Network Intelligence
  - Approved by IEEE ComSoc on December 2017
  - It inherits from TCAC – Technical sub-Committee on Autonomic Communications

Mission

To support and endorse research towards embedding Artificial Intelligence in future software-defined networks and programmable forwarding planes.

- Aim: support and endorse
- The vision of embedding intelligence into the network will allow greater level of automation and adaptiveness, enabling
  - Faster deployment
  - Dynamic provisioning, in line with the dynamic nature of network functions
  - End-to-end orchestration, to ensure coherent deployment of IT and network infrastructures, and service chains
  - High resiliency and availability of networks and services

Topics

- Declarative policies (Intent) for orchestration and management
  - including Natural language processing for service deployment, change and assurance
- Learning techniques
  - supervised, unsupervised and reinforcement learning (forecasting, clustering and classification techniques) for resilient network
- Optimal resource allocation and placement and for network action recommendations
- Knowledge base
  - graph database and advanced data mining techniques to ensure coherency of emerging networks (SDN, NFV, cloud and 5G)
- Autonomic for software networks
- Self-configuration, self-optimization, self-healing and self-protection in programmable and software-defined networks
- Self-optimization for dynamic controllers and virtual network functions placement
- Policy-based management, including imperative, declarative (intent), and other paradigms
- Learning and reasoning techniques for programmable networks
- Data analytics and machine learning for autonomic management
- Autonomic based service lifecycle management and orchestration
- Autonomic resource allocation and configuration in virtualized infrastructures
- Adaptive scheduling in cloud computing environments

Officers

- **Chair** | Imen Grida Yahia
- **Vice Chair** | Mohamed Faten Zhani
- **Technical Program Chair** | Noura Limam
- **Standards Liaison** : Laurent Ciavaglia
- **Secretary** | Weverton Cordeiro

Participation

- Open to everyone willing to actively participate in the ETI activities
  - Interested? contact the chairs!

More information ?

- NI Website: http://ni.committees.comsoc.org/
- NI Mailing List:
  - etini@comsoc.org
  - To subscibre to the mailing list, please contact NI officers

Some ongoing activities

- **3rd International Workshop on Network Intelligence (NI)**
  - Co-located with IEEE Infocom 2020 https://ni.committees.comsoc.org/ni-workshop-2020
  - Submission Deadline: Jan. 15th, 2020

- **3rd AI Net Conference (2020)**
  - Co-located with MPLS+SDN+NFV conference, 31 March – 02 April 2020, Paris https://www.uppersideconferences.com/ainet/

- **3rd Applied Machine Learning Days (AMLD 2020) – AI & Networks Track**
  - 25-29 January 2020, Lausanne
  - https://appliedmldays.org/tracks/ai-networks

- **Standards areas where members contribute**: IETF/IRTF, ETSI, IEEE…

- **Future Special Issues in IEEE ComSoc journals and magazines**

Network Data: a key activity area

- Network data are characterized by high-dimensional spaces
  - Hundreds or thousands of dimensions
  - Numerous of KPIs, measurements, and counters to track

- Network data is heterogeneous
  - Per segment (access, metro, core, DC, home...)
  - Per topology
  - Variety of types and formats: CDN logs, OSS logs, QoS/QoE metrics, alarms, trouble tickets, service KPIs, configuration files

- Labelling Network Data is a **<u>HUGE</u>** effort

Network Intelligence as a domain requires a community tracking all advances, pushing for cross-fertilization, bringing together data science challenges for network data, etc.