MAIN TECHNICAL PROGRAM

Monday

Session 1 – Keynote 1

Chair: Jean-Charles Grégoire
Monday 9:00 – 10:00, room A-1600

Looking Beyond the Internet (Keynote 1)
Chip Elliott (GENI Futures Director, GENI - Global Environment for Network Innovations, USA)

Session 2 - Optimization I

Chair: Jacek Rak
Monday 10:30 – 12:30, room A-1600

Packet Routing and Frame Length Optimization in Wireless Mesh Networks with Multicast Communications
Artur Tomaszewski (Warsaw University of Technology, Poland)
Michał Pióro (Warsaw University of Technology, Poland & Lund University, Sweden)

3G/4G load-balancing optimization for mobile network planning
Matthieu Chardy, Mariem Ben Yahia and Yu Bao (Orange Labs, France)

Modeling and Optimization of Content Delivery Networks with heuristics solutions for the Multidimensional Knapsack Problem
Veronica Quintuna (Orange Labs, France)
Maxime Laye (Orange, France)

Towards Automatic Performance Optimization of Networks Using Machine Learning
Fabien Geyer (Airbus Group Innovations, Germany)
Georg Carle (Technische Universität München, Germany)

Session 3 – Keynote 2 & Invited Presentations

Chair: Christine Tremblay
Monday 13:30 – 15:30, room A-1600

Scaling the Network for a Rapidly Changing Service Ecosystem (Keynote 2)
Loudon Blair (Senior Director of Corporate Strategy, Ciena, USA)

Elements of techno-economic modelling for the planning, provisioning and operation of virtualized networks (Invited 1)
Robin Bailey (Implied Logic Limited, UK)

Assuring Right-On-Demand Service Launches in the Virtualized Network (Invited 2)
Caroline Chappell (Cloud & NFV, Heavy Reading, UK)
Ihab Mahna (EXFO, Canada)

Session 4A – Security

Chair: Jean-Charles Grégoire
Monday 16:00 – 17:30, room A-1600

Embedding Security and Privacy into the Development and Operation of Cloud Services (Invited 5)
Tran Quang Thanh, Stefan Covaci and Thomas Magedanz (Technical University Berlin and Fraunhofer FOKUS Berlin, Germany)
Panagiotis Gouvas, Anastasios Zafeiropoulos (Ubitech Ltd., Athens, Greece)

Security Analysis of OpenDayLight, ONOS, Rosemary and RYU SDN Controllers
Ramachandra Kamath Arbettu (Technische Universität Darmstadt, Germany)
Rahamatullah Khondoker (Fraunhofer SIT, Germany)
Kpatcha Bayarou (Fraunhofer Institute for Secure Information Technology, Germany)
Frank G. Weber (Fraunhofer SIT, Germany)

Evaluation of EAP Re-authentication Protocol (ERP)
Piotr Pacyna and Rafal Chrabaszcz (AGH University of Science and Technology, Poland)

Adaptive Bubble Burst (ABB): Mitigating DDoS Attacks in Software-Defined Networks
Danish Sattar, Ashraf Matrawy and Olufemi Adeojo (Carleton University, Canada)

Session 4B – Planning

Chair: Akiya Inoue
Monday 16:00 – 17:30, room A-1804

Network Planning Strategies for Integrated Packet Optical Networks (Invited 6)
Robert Keys (Juniper, USA)

Walk test simulator for LTE/LTE-A network planning
Diego Castro-Hernandez and Raman Paranjape (University of Regina, Canada)

Volume-based Pricing in Stackelberg Duopoly Wireless Markets
Behdad Heidarpour (École De Technologie Supérieure, Canada)
Shahin Vakilinia (Synchromedia, Canada)
Zbigniew Dziong (École de technologie supérieure, Canada)

Global Queue Management for the Provision of QoS in Computer Networks
Rossano P. Pinto (School of Technology of Americana - Centro Paula Souza, Brazil)

Session 5 – Posters

Monday 17:30 – 20:00, corridor Pas Perdus
Poster Session Program is listed on page 6.

Tuesday

Session 6 - Keynote 3

Chair: Zbigniew Dziong
Tuesday 9:00 – 10:00, room A-1600

From Smart Transportation to Smart City Platform (Keynote 3)
Alberto Leon-Garcia (Scientific Director of the NSERC Strategic Network for Smart Applications on Virtual Infrastructures, SAVI, Canada).

Session 7A – Infrastructures and services

Chair: Kim Khoa Nguyen
Tuesday 10:30 – 12:30, room A-1600

Estimates of the economic impact of energy savings in the E2E chain for Video on Demand service
Kinga Pilarska (ORANGE LABS NETWORKS, Poland)
Nancy Perrot (Orange Labs, France)
Bernard Liau (France Telecom, France)

Real-Time Optimized NFV Architecture for Internetworking WebRTC and IMS
Duong Tuan Nguyen, Kim Khoa Nguyen, Saida Khazri and Mohamed Cheriet (École de technologie supérieure, Canada)

Non-intentional mobility of data sessions across mobile networks while roaming because of operators' mobile DNS architecture
Guillaume Boulmier (Orange Labs, France)

On the Relationship between Packet Jitter and Buffer Loss Probabilities
Hadhami Dbira (Ecole Polytechnique Montreal, Canada)
Andre Girard (INRS-EMT and GERAD, Canada)
Brunilde Sansò (Ecole Polytechnique de Montreal, Canada)

Session 7B – Optimization II

Chair: Bernard Liau
Tuesday 10:30 – 12:30, room A-1804

Reward-based Online Routing and Spectrum Assignment in Flex-grid Optical Networks
Ronald Romero Reyes (Technische Universität Chemnitz, Germany)
Thomas Bauschert (Chemnitz University of Technology, Germany)

Optimisation for Energy Reduction of Aerial Backhauled Networks Based on Cluster Aggregation
Stanislas Francfort (Orange Labs, France)

Ultra broadband network performance in a multi operator scenario
Alessandro Valenti and Arianna Rufini (Fondazione Ugo Bordoni, Italy)
Guido Maier and Giacomo Verticale (Politecnico di Milano, Italy)
Stefano Penna (Istituto Superiore delle Comunicazioni - Ministry of Economic Development, Italy)
Vincenzo Attanasio (Iscom, Italy)

Session 8 – Keynote 4 & Invited Presentations

Chair: Michał Pióro
Tuesday 13:30 – 15:30, room A-1600

Agile Operating Model for a Software Driven World (Keynote 4)
Ramesh Nagarajan (Chief Innovation Director in the Communication, Media and Technology operating unit of Accenture, USA)

ILP Modeling of Flexgrid SDM Optical Networks (Invited 3)
Krzysztof Walkowiak, Mirosław Klinkowski and Piotr Lechowicz (Wroclaw University of Technology, Poland)
Arunabha Sen (Wroclaw University of Technology, Poland, and Arizona State University, USA)

A Taxonomy of Challenges to Resilient Message Dissemination in VANETs (Invited 4)
Jacek Rak (Gdansk University of Technology, Poland)
Magnus Jonsson and Alexey Vinel (Halmstad University, Sweden)

Session 9A – Software Defined Networks (SDN)

Chair: Jean-Charles Grégoire
Tuesday 16:00 – 17:30, room A-1600

Software Architecture for Hybrid Electrical/Optical Data Center Network
Victor Mehmeri and Juan Jose Vegas Olmos (Technical University of Denmark, Denmark)
Idelfonso Tafur Monroy (Technical University of Denmark, Denmark & ITMO University, Russia)

Energy-Efficient Load Balancing in a SDN-based Data-Center Network
Yannick Carlinet and Nancy Perrot (Orange Labs, France)

Dynamic Priority-adjustment for Real-time Flows in Software-defined Networks
Namwon An and Taejin Ha (Gwangju Institute of Science and Technology, Korea)
Kyung-Joon Park (DGIST, Korea)
Hyuk Lim (Gwangju Institute of Science and Technology, Korea)

Adaptive Consistency for Distributed SDN Controllers
Mohamed Aslan and Ashraf Matrawy (Carleton University, Canada)

Performance Analysis of Resource Pooling for Network Function Virtualization
Veronica Quintuna and Fabrice M. Guillemin (Orange Labs, France)

Session 9B – Quality of Service (QoS)

Chair: Francesc Burrull
Tuesday 16:00 – 17:30, room A-1804

Towards the Analysis of Transient Phases with Stochastic Network Calculus
Michael A. Beck (University of Kaiserslautern, Germany)

Supervised Learning Based Automatic Adaptation of Virtualized Resource Selection Policy
Takaya Miyazawa and Hiroaki Harai (National Institute of Information and Communications Technology, Japan)

Quality of Service monitoring adopting correlation among active and passive measurements: The experience from the FP7 mPlane project
Francesco Matera, Edion Tego, Arianna Rufini and Alessandro Valenti (Fondazione Ugo Bordoni, Italy)
Marco Mellia and Stefano Traverso (Politecnico di Torino, Italy)
Ehran Kahveci and Mercedes Scarpino (Fastweb, Italy), Fabrizio Invernizzi (TIM, Italy)

Network Management Based QoE Estimation for Adaptive Streaming over HTTP
Phan Tan and Eiji Kamioka (Shibaura Institute of Technology, Japan)

Wednesday

Session 10 - Keynote 5

Chair: Kim Khoa Nguyen
Wednesday 9:00 – 10:00, room A-1600

How Future Networks can make a contribution to the Networked Society (Keynote 5)
Pierre Boucher (Research Director, Ericsson Canada)

Session 11A – Network Design

Chair: Bernard Liau
Wednesday 10:30 – 12:30, room A-1600

Requirement Modeling Language for the Dynamic Node Integration Problem
Yu Nakayama (The University of Tokyo); Kaoru Sezaki (University of Tokyo, Japan)

Intelligent Configuration of the Limitation Mechanism in Flow-Aware Networks
Robert Wójcik and Jerzy Domżał (AGH University of Science and Technology, Poland)

Resource Survivability for Multicast in Elastic Optical Networks
Dylan A.P. Davis and Vinod M. Vokkarane (University of Massachusetts Lowell, USA)

Aircraft harness measurement campaign and investigations on introducing one pair Ethernet
Alexandros Elefsiniotis and Sebastian Hahn (Airbus Group Innovations, Germany)

Virtual Topologies for Topology Abstraction Service for IP-VPNs
Lavanya Sivakumar (SRM Research Institute & SRM University, India)
Jayaram Balabaskaran (VIT University, India)
Krishnaiyan Thulasiraman (University of Oklahoma, USA)
S. Arumugam (Kalasalingam University, India)

Session 11B - Wireless networks

Chair: Akiya Inoue
Wednesday 10:30 – 12:30, room A-1804

A Coalitional Game for Femtocell Clustering in OFDMA Macro-femtocell Networks
Katty Rohoden-jaramillo (École de technologie supérieure, Canada)
Rebeca Estrada (Electrical Engineering and Computer Science Faculty, ESPOL, Ecuador)
Hadi Otrok (Khalifa University of Science, Technology & Research, KUSTAR, Abu Dhabi, UAE)
Zbigniew Dziong (École de technologie supérieure, Canada)

User cooperation mechanism for temporal traffic smoothing in mobile networks
Yusuke Tanaka and Ryoichi Shinkuma (Kyoto University, Japan)
Eiji Takahashi and Takeo Onishi (NEC Corporation, Japan)

Joint Path Relay Selection in 5G Multi-hop Relay Networks
Abderrahmane BenMimoune and Kadoch Michel (École de technologie supérieure, Canada)

Precise and Fast interactive Area QoE Management Framework toward 5G Era
Takashi Satake (NTT, Japan)

Session 12 – Workshop on Network Security

Chair: Christine Tremblay
Wednesday 13:30 – 15:30, room A-1600

Finding the needle in the haystack – How SDN & Network virtualization enables better visibility and containment
Bruno Germain (VMware, Canada)

Today's cybersecurity challenges require more management than ever before.
Troy Bryant (Research and Development, TELUS, Canada)

How to stay agile when applying security assurance to SDN/NFV projects
Vivek Khindria (Director Information Security, Bell Canada)

SS7 and Diameter Security
Andrew Ho (Senior Director, Information & Cyber Security Unit, Rogers, Canada)
Andrew Ho (Rogers, Canada)

Workshop program with abstracts is provided on page 7.

POSTER SESSION PROGRAM

Net2Plan-Aire: gained experience in an ad-hoc SDN development for a metro carrier network
Pablo Pavon-Marino (Technical University of Cartagena, Spain)
Maria Victoria Bueno (UPCT, Spain)
Javier Lopez-Fernandez, Jorge San-Emeterio-Villalain, Jose-Juan Pedreno-Manresa and Francesc Burrull (Universidad Politécnica de Cartagena, Spain)
Zigor Gaubeca-Canalechevarria, Miguel Tecles and Jose-Luis Izquierdo-Zaragoza (Aire Networks, Spain)

VoLTE and VoWiFi Services Degradation Root Causes Analysis: Challenges and Open Problems
Joanna Balcerzak and Stephane Senecal (Orange Labs, France)
Grzegorz Tyszka (Orange Labs Poland, Poland)

Integration of Network Coding, Spatial Diversity and Opportunistic Routing/Forwarding in Wireless Mesh Networks
Rizwan Khan (École de Technologie Supérieure, Canada)

Self-configurable WiFi backhaul for the IoT air pollution monitoring
Krzysztof Loziak, Janusz Gozdecki and Lucjan Janowski (AGH University of Science and Technology, Poland)

Building a flow-based traffic model of personal cloud storage using a mixture of distributions
Grzegorz Rzym and Krzysztof Wajda (AGH University of Science and Technology, Poland)

Multifaceted Faculty Network Design and Management Evolution
Michael Assels, Serguei Mokhov, Michael Spanner, Manny Taveroff and Francois Carriere (Concordia University, Canada)

A Reconfigurable Routing Strategy for Reliable Networks-on-Chip
Poona Bahrebar and Dirk Stroobandt (Ghent University, Belgium)

Throughput Analysis of Cloud Cognitive Radio
Sandeep Dhavane and Mohammed Khan (Indian Institute of Technology Hyderabad, India)

Agile Filterless Submarine Ring Networks
Md. Nooruzzaman (Technical University of Denmark, Denmark)
Nabih Alloune, Feriel Nabet, Émile Archambault and Christine Tremblay (École de technologie supérieure, Canada)
Marija Furdek, Jiajia Chen and Lena Wosinska (KTH Royal Institute of Technology, Kista, Sweden)
Paul Littlewood and Michel P. Bélanger (Ciena Corporation, Ottawa, Canada)

Smart grid Traffic Analysis in GSM and LTE Networks using Multidimensional Markovian Process
Vishwajeet Singh and Mohammed Khan (Indian Institute of Technology Hyderabad, India)

Transformative Design Model towards an End-to-end Integrated-Optical-Packet-Network in Metro and Core Networks
Nassim Haddaji (Ciena Corporation, Canada)
Kim Nguyen and Mohamed Cheriet (École de technologie supérieure, Canada)

An Efficient Communications Protocol for Reticent Sender Cooperated with Aggressively Speaking Receiver
Takuya Okamoto and Katsunori Yamaoka (Tokyo Institute of Technology, Japan)

Physical Layer Impairments in a MLR Network
Hussein Chouman, Mounia Lourdiane and Cédric Ware (Télécom ParisTech, Université Paris Saclay, France)

WORKSHOP ON NETWORK SECURITY PROGRAM

Join this session for an overview of modern information security challenges for Service providers and Service integrators. What are their priorities? How this aspect of their network has evolved over the last few years and what are they expecting in the future? What are today's best practices in security for a service provider? This workshop will cover an up to date overview of today's modern security landscape as well as a round table session to go through several questions on the topic.

Finding the needle in the haystack – How SDN & Network virtualization enables better visibility and containment

Bruno Germain (VMware, Canada)

Abstract :

There has been a lot of attention in the last years on post-intrusion tools and analytics with a proliferation of new offerings from both startups and established vendors. The stated objective being to provide better correlation between events in the Security Information and Event Management (SIEM) "haystack" in the hope of reducing the time required to pinpoint a breach, thus limiting the spread of the attack and avoid data exfiltration. The assumption underlying this approach is that the tools have access to all the data, from network flows to security logs, in order to apply some logic to uncover abnormal behavior. While these tools are worth investigating, could we not leverage some more fundamental changes to the underlying security architecture, enabled by network virtualization, that could yield even higher returns from these tools if deployed? In short, instead of sending the proverbial haystack more hay, could we not reduce the size of the data to look at with better contextual information while providing better containment for the breach, thus providing more time and better probabilities of uncovering the attack? This session will examine SDN, micro-segmentation and automation of policies in the context of a data center and discuss their impact on fundamental security properties such as context, visibility and containment. Lastly, we will see how current tools can benefit from such enhanced properties to deliver a better security solution.

Today's cybersecurity challenges require more management than ever before.

Troy Bryant (Research and Development, TELUS, Canada)

Abstract :

Today's cybersecurity challenges require more management than ever before. TELUS will review some of the more advanced programs that it includes in its security management portfolio and some of the challenges it see on the horizon as the carrier network evolves in the face of 5G mobile networks, carrier virtualization and the IoT.

How to stay agile when applying security assurance to SDN/NFV projects

Vivek Khindria (Director Information Security, Bell Canada)

Abstract:

As many telecommunications and large enterprises move forward to embrace the agility and automation around use of Software Defined Networks (SDN) and Network Function Virtualization (NFV), many are at the same times integrating Agile and DevOps models. All of these elements combined challenge traditional security assurance models. This discussion will talk to the key security challenges as well as some suggestions on how to adapt information security controls and assurance methods to fit better in the new world.

SS7 and Diameter Security

Andrew Ho (Senior Director, Information & Cyber Security Unit, Rogers, Canada)

Abstract :

Once considered trusted and an internal network amongst telco's, SS7 and Diameter signalling networks are now confronted with unprecedented volume and types of malicious activities recently. It threatens not only telco revenues, but also the privacy of the end customers. I'll attempt to provide a summary update on the joint effort by standard bodies, equipment vendors and carriers in combating this threat.