2018 4th IEEE Conference on Network Softwarization and Workshops (NetSoft 2018)

Montreal, Quebec, Canada
25-29 June 2018
Technical Sessions
Tuesday, June 26, 2018
10:30 a.m. – 12:30 p.m.
Room: Cartier
PS1 – SDN Control and Reliability
Session Chair: Rashid Mijumbi, Nokia – Bell Labs, Ireland

A Novel Algorithm for Flow-Rule Placement in SDN Switches
Artur Pilimon, Technical University of Denmark, Denmark
Angelos Mimidis, Technical University of Denmark, Denmark
José Soler, Technical University of Denmark, Denmark
Michael Berger, Technical University of Denmark, Denmark
Sarah Ruepp, Technical University of Denmark, Denmark

Efficient Data Plane Protection for SDN
Daniel Merling, University of Tuebingen, Germany
Wolfgang Braun, University of Tuebingen, Germany
Michael Menth, University of Tuebingen, Germany

Fast Control Channel Recovery for Resilient In-band OpenFlow Networks
Abu Saleh Mohammad Asadujjaman, Banglalink Digital Communications Ltd., Bangladesh
Elisa Rojas, University of Alcala, Spain
Mohammad Shah Alam, Bangladesh University of Engineering and Technology, Bangladesh
Suryadipta Majumdar, Concordia University, Canada

2:00 p.m. – 3:30 p.m.
Room: Cartier
PS2 – Security & Monitoring
Session Chair: Danny Raz, Technion, Israël

DARN: Dynamic Baselines for Real-time Network Monitoring
Rashid Mijumbi, Nokia, Ireland
Markku Koivunen, Nokia, Finland
Haiyong Fu, Nokia, P.R. China
Abhaya Asthana, Nokia, USA
Norman Zhu, Nokia, P.R. China

A Security Orchestration System for CDN Edge Servers
Elaheh Jalalpour, University of Waterloo, Canada
Milad Ghaznavi, University of Waterloo, Canada
Daniel Migault, Ericsson, Canada
stere preda, Ericsson, -- Select Country --
Makan Pourzandi, Ericsson Research, Canada
Raouf Boutaba, University of Waterloo, Canada

Container-based design of a Virtual Network Security Function
Marco De Benedictis, Politecnico di Torino, Italy
Antonio Lioy, Politecnico di Torino, Italy
Paolo Smiraglia, Politecnico di Torino, Italy
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Room: Cartier
PS3 – SDN at the Edge
Session Chair: Slawomir Kuklinski, Orange Labs Poland, Poland

A new RAN slicing strategy for multi-tenancy support in a WLAN scenario
Aikaterini Koutlia, Universitat Politecnica de Catalunya (UPC), Spain
Anna Umbert, Universitat Politecnica de Catalunya (UPC), Spain
Roberto Riggio, FBK CREATE-NET, Italy
Irene Vilà, Universitat Politecnica de Catalunya (UPC), Spain
Fernando Casadevall, Universitat Politècnica de Catalunya - UPC, Spain

Evolving SDN for Low-Power IoT Networks
Michael Baddeley, University of Bristol, Great Britain
Reza Nejabati, University of Bristol, Great Britain
George Oikonomou, University of Bristol, Great Britain
Mahesh Sooriyabandara, University of Bristol, Great Britain
Dimitra Simeonidou, University of Bristol, Great Britain

Load Profiling and Migration for Effective Cyber Foraging in Disaster Scenarios with FORMICA
Agnese Vincenza Ventrella, Politecnico di Bari, Italy
Flavio Esposito, Saint Louis University, USA
Alfredo Grieco, Politecnico di Bari, Italy

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PS4 – Service Migration
Session Chair: Giovanni Schembra, University of Catania, Italy

Towards A Fast Service Migration in 5G [Paper Withdrawn]
Rami Akrem Addad, Aalto University, Finland
Diego Leonel Cadette Dutra, COPPE, Universidade Federal do Rio de Janeiro, Brazil
Miloud Bagaa, Aalto, Finland
Tarik Taleb, Aalto University, Finland
Hannu Flinck, NOKIA, Finland

Let the state follow its flows: An SDN-based flow handover protocol to support state migration
Manuel Peuster, University of Paderborn, Germany
Hannes Küttner, University of Paderborn, Germany
Holger Karl, University of Paderborn, Germany

EVPN/SDN Assisted Live VM Migration between Geo-Distributed Data Centers
Kyoomars Alizadeh, Karlstad University, Sweden
Andreas Kassler, Karlstad University, Sweden
Prem Sankar Gopannan, Ericsson, USA
Thursday, June 28, 2018
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**PS5 – NFV Placement**

**Session Chair:** Mohamed-Faten Zhani, *Ecole de Technologie Supérieure, Canada*

**Virtual Function Placement and Traffic Steering over 5G Multi-Technology Networks**
Nabeel Akhtar, *Boston University, USA*
Ibrahim Matta, *Boston University, USA*
Ali Raza, *Boston University, USA*
Leonardo Goratti, *CREATE-NET, Italy*
Torsten Braun, *University of Bern, Switzerland*
Flavio Esposito, *Saint Louis University, USA*

**Scaling and Placing Bidirectional Services with Stateful Virtual and Physical Network Functions**
Sevil Dräxler, *Paderborn University, Germany*
Stefan Schneider, *Paderborn University, Germany*
Holger Karl, *University of Paderborn, Germany*

**Latency Aware Placement in Multi-access Edge Computing**
Dor Harris, *Technion, Israel*
Joseph Naor, *Technion, Israel*
Danny Raz, *Technion, Israel*

**A Green VNF-FG Embedding Algorithm**
Oussama Soualah, *Institut-Mines Telecom, Telecom SudParis, France*
Marouen Mechtri, *Orange Labs, France*
Chaima Ghribi, *Telecom SudParis, -- Select Country --*
Djamal Zeghlache, *Télécom SudParis, France*

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**PS6 – Modeling, Ontologies & Machine Learning**

**Session Chair:** Olivier Festor, *Telecom Nancy, France*

**Hierarchical Two Dimensional Queuing: A Scalable Approach for Traffic Shaping using Software Defined Networking**
Sandip Chakraborty, *IIT Kharagpur, India*
Sumitro Bhaumik, *IIT Kharagpur, India*

**ReasoNet: Inferring Network Policies Using Ontologies**
Charalampos Rotsos, *Lancaster University, Great Britain*
Arsham Farshad, *Lancaster University, Great Britain*
Qianru Zhou, *Heriot-Watt University, Great Britain*
Daniel King, *Lancaster University, Great Britain*
Alasdair J. G. Gray, *Heriot-Watt University, Great Britain*
Cheng-Xiang Wang, *Heriot-Watt University, Great Britain*
Stephen McLaughlin, *Heriot-Watt University, Great Britain*
David Hutchison, *Lancaster University, Great Britain*

**Applying Big Data, Machine Learning, and SDN/NFV to 5G Traffic Clustering, Forecasting, and Management**
Luong Vy Le, *National Chiao Tung University, Taiwan*
Bao-Shuh Paul Lin, *National Chiao Tung University, Taiwan*
Li-Ping Tung, *National Chiao Tung University, Taiwan*
Sinh Do, *National Chiao-Tung University, Taiwan*
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**TS1 – QoS, Reliability & Security**

Session Chair: Stere Preda, *Ericsson Research, Canada*

**Domain Federation via MPLS and SDN for Dynamic, Real-time End-to-end QoS Support**  
Sidhant Hasija, *Waterford Institute of Technology, Ireland*
Rashid Mijumbi, *Nokia, Ireland*
Steven Davy, *Telecommunications Software and Systems Group, Waterford Institute of Technology, Ireland*
Alan Davy, *Waterford Institute of Technology, Ireland*
Brendan Jennings, *TSSG, Waterford Institute of Technology, Ireland*
Keith Griffin, *Cisco, Ireland*

**QualitySDN: Improving Video Quality using MPTCP and Segment Routing in SDN/NFV**  
Alcardo Alex Barakabitze, *University of Plymouth, Great Britain*
Is-Haka Mkwawa, *Plymouth University, Great Britain*
Lingfen Sun, *University of Plymouth, UK, Great Britain*
Emmanuel Ifeachor, *Plymouth University, Great Britain*

**One-to-many file transfer using multipath-multicast with gossiping**  
Kenji Heira, *Kyushu Institute of Technology, Japan*
Kyohei Ogawa, *Kyushu Institute of Technology, Japan*
Masato Tsuru, *Kyushu Institute of Technology, Japan*

**Anomaly Detection using Resource Behaviour Analysis for Autoscaling systems**  
Rajsimman Ravichandiran, *Student, -- Select Country --*
Hadi Bannazadeh, *University of Toronto, Canada*
Alberto Leon-Garcia, *University of Toronto, Canada*

**NFV-compliant Traffic Monitoring and Anomaly Detection based on Dispersed Vantage Points in Shared Network Infrastructures**  
Adam Pavlidis, *National Technical University of Athens, Greece*
Giannis Sotiropoulos, *NTUA, Greece*
Kostas Giotis, *National Technical University of Athens, Greece*
Dimitris Kalogeras, *National Technical University of Athens, Greece*
Vasilis Maglaris, *National Technical University of Athens, Greece*

**Deep Recurrent Neural Network for Intrusion Detection in SDN-based Networks**  
Anh Tuan Tang, *University of Leeds, Great Britain*
Lotfi Mhamdi, *The University of Leeds, Great Britain*
Des McLernon, *The University of Leeds, Great Britain*
Syed Ali Raza Zaidi, *The University of Leeds, Great Britain*
Mounir Ghogho, *The University of Leeds, International University of Rabat, Great Britain*

**SDN-based Attack Detection in Wireless Local Area Networks**  
Radoslaw Cwalinski, *Brandenburg University of Technology Cottbus, Germany*
Hartmut König, *Brandenburg University of Technology Cottbus-Senftenberg, Germany*

**Stateful Distributed Firewall as a Service in SDN**  
Ali Zeineddine, *American University of Beirut, Lebanon*
Wassim El-Hajj, *American University of Beirut, Lebanon*
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Session Chair: Alex Galis, *University College London, UK*

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Adlen Ksentini, *Eurecom, France*
Eleonora Cau, *Fraunhofer FOKUS Institute, Germany*
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Assessing Lightweight Virtualization for Security-as-a-Service at the Network Edge [Paper Withdrawn]  N/A
Abderrahmane Boudi, *Ecole nationale Supérieure d'Informatique, Algeria*
Ivan Farris, *Aalto University, Finland*
Miloud Bagaa, *Aalto, Finland*
Tarik Taleb, *Aalto University, Finland*
Yacine Khettab, *Aalto University, Finland*

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**TS3 – Programmability & SDN Control**

Session Chair: Eduardo Jacob, *University of the Basque Country, Spain*

**Semantic-Based Global Network View Construction in Software Defined Networks with Multiple Controllers**

Wassim Sellil Atoui, *Orange Labs, France*
Imen Grida ben yahia, *Orange labs, France*
Walid Gaaloul, *Télécom SudParis, France*

**LODGE: LOcal Decisions on Global statEs in programmable data planes.**

German Sviridov, *Politecnico di Torino, Italy*
Paolo Giaccone, *Politecnico di Torino, Italy*
Marco Bonola, *University of Rome Tor Vergata, Italy*
Andrea Bianco, *Politecnico di Torino, Italy*
Angelo Tulumello, *CNIT - University of Rome Tor Vergata, Italy*
Giuseppe Bianchi, *University of Roma Tor Vergata, Italy*

**Comprehensive Prediction Models of Control Traffic for SDN Controllers**

Bong-yeol Yu, *Korea University, Republic of Korea*
Gyeongsik Yang, *Korea University, Republic of Korea*
Chuck Yoo, *Korea University, Republic of Korea*

**A Network Coding Approach for In-Band Control Traffic Dissemination for Software Defined Networks**

Fayaz Akhtar, *Waterford Institute of Technology, Ireland*
Mubashir Rehmani, *Waterford Institute of Technology, Ireland*
Alan Davy, *Waterford Institute of Technology, Ireland*

**ONOS Intent Monitor and Reroute service: enabling plug and play routing logic**

Davide Sanvito, *Politecnico di Milano, Italy*
Daniele Moro, *Politecnico di Milano, Italy*
Mattia Gulli, *Politecnico di Milano, Italy*
Ilario Filippini, *Politecnico di Milano, Italy*
Antonio Capone, *Politecnico di Milano, Italy*
Andrea Campanella, *Open Networking Foundation, USA*

**Fault Tolerance Comparison of ONOS and OpenDaylight SDN Controllers**

Jose Manuel Sanchez Vilchez, *Orange Labs, France*
David Espinel Sarmiento, *Orange Labs Networks, France, France*

**Efficient Multicore Scaling in Software Packet Forwarding Engines**

Hirochika Asai, *Preferred Networks, Inc., Japan*
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**TS4 – Service Function Chaining & Network Function Placement**
Session Chair: Abdelkader Lahmadi, *University of Lorraine, France*

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Chung-Horng Lung, *Carleton University, Canada*  
Mohamed Ibnkahla, *Carleton University, Canada*  |
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Mohammad Mehdi Mirzaei, *University of Tehran, Iran*  
Jérémie Leguay, *Huawei, France Research Center, France*  
Ehsan Ahvar, *Telecom sudparis, France*  
Ahmed Mohamed Medhat, *Technical University of Berlin, Germany*  
Noël Crespí, *Telecom Sud Paris, France*  
Roch Glitho, *Concordia University, Canada*  |
| LARAC-SN and Mole in the Hole: Enabling Routing through Service Function Chains | Amaury Van Bemten, *Technical University of Munich, Germany*  
Jochen W. Guck, *Technical University of Munich, Germany*  
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Carmen Mas Machuca, *Technische Universität München (TUM), Germany*  
Wolfgang Kellerer, *Technical University of Munich (TUM), Germany*  |
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Byrav Ramamurthy, *University of Nebraska-Lincoln, USA*  |
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Massimo Tornatore, *Politecnico di Milano, Italy*  
Brigitte Jaumard, *Concordia University, Canada*  
Biswaanath Mukherjee, *University of California, Davis, USA*  |
| PCPV: Pattern-based Cost-efficient Proactive VNF Placement and Chaining for Value-Added Services in Content Delivery Networks | Shohreh Ahvar, *Institut Télécom SudParis, France*  
Jagruti Sahoo, *Department of Mathematics and Computer Science, South Carolina State University, USA*  
Ehsan Ahvar, *Telecom SudParis, France*  
Mouhamad Dieye, *Université du Québec A Montréal, Canada*  
Roch Glitho, *Concordia University, Canada*  
Halima Elbiaze, *UQAM, Canada*  
Noel Crespi, *Institut Mines-Telecom, France*  |
| Generating Resource and Performance Models for Service Function Chains: The Video Streaming Case | Sevil Dräxler, *Paderborn University, Germany*  
Manuel Peuster, *University of Paderborn, Germany*  
Marvin Illian, *Paderborn University, Germany*  
Holger Karl, *University of Paderborn, Germany*  |
Demos

Tuesday, June 26, 2018
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Room: Champlain

DS1

A Prototype for Dynamic Provisioning of QoS-oriented Virtualized Network Functions in the Internet of Things
Clovis Anicet Ouedraogo, LAAS-CNRS

Service Specific Management and Orchestration for a Content Delivery Network
Thomas Soenen, UGENT - imec, Belgium
Wouter Tavornier, Ghent University - imec, Belgium
George K. Xilouris, N.C.S.R Demokritos, Greece
Stavros Kolometos, NSCR Demokritos, Greece
Felipe Vicens, ATOS, Spain
Einar Meyerson Uriarte, i2CAT Foundation Barcelona - Spain, Spain
Muhammad-Shuaib Siddiqui, i2CAT, Spain

Dynamic Security Orchestration for CDN Edge-Servers
Elaheh Jalalpour, University of Waterloo, Canada
Milad Ghaznavi, University of Waterloo, Canada
Daniel Migault, Ericsson, Canada
stere preda, Ericsson, -- Select Country --
Makan Pourzandi, Ericsson Research, Canada
Raouf Boutaba, University of Waterloo, Canada

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DS2

Enabling external routing logic in ONOS with Intent Monitor and Reroute service
Davide Sanvito, Politecnico di Milano, Italy
Daniele Moro, Politecnico di Milano, Italy
Mattia Gulli, Politecnico di Milano, Italy
Ilario Filippini, Politecnico di Milano, Italy
Antonio Capone, Politecnico di Milano, Italy
Andrea Campanella, Open Networking Foundation, USA

Containernet 2.0: A Rapid Prototyping Platform for Hybrid Service Function Chains
Manuel Peuster, University of Paderborn, Germany
Johannes Kampmeyer, Paderborn University, Germany
Holger Karl, University of Paderborn, Germany
5G Edge Resource Federation: Dynamic and Cross-domain Network Slice Deployment

Amina Boubendir, Orange Labs / Télécom ParisTech, France
Fabrice Guillemin, Orange Labs, France
Frédéric Faucheux, Nokia Bell Labs, France
Barbara Orlandi, Nokia Bell Labs, France
Jean-Luc Lafragette, Nokia Bell Labs, France
Christophe Le Toquin, Orange Labs, France
Sylvaine Kerboeuf, Nokia Bell Labs, France
Marie-Line Alberi Morel, Nokia Paris Saclay, France

Demonstration of a framework for enabling security services collaboration across multiple domains

Thiago R.M. Almeida, Universidade de São Paulo, Brazil
Bruno Medeiros de Barros, Ecole Normale Superieure, France
Ewerton Rodrigues Andrade, Federal Institute of Rondonia (IFRO), Brazil
Marcos Antonio Simplicio Jr, Escola Politécnica - USP, Brazil
Daniel Migault, Ericsson, Canada
Makan Pourzand, Ericsson Research, Canada

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DS3

Pishahang: Joint Orchestration of Network Function Chains and Distributed Cloud Applications

Hadi Razzaghi Kouchaksaraei, Paderborn University, Germany
Tobias Dierich, Paderborn University, Germany
Holger Karl, University of Paderborn, Germany

An Integrated Control of IP and Optical Network for Multi-grade Virtualized Networks

Takuya Tojo, NTT, Japan
Shingo Okada, NTT, Japan
Yoshiyuki Hirata, NTT, Japan
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